The Veterinary Record

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General Articles

The King's Silver Jubilee

THE PERIOD 1910-1935 IN INTIMATE RETROSPECT

On May 6th, there will be celebrated the twenty-fifth anniversary of the accession to the throne of His Majesty King George the Fifth. It will be an occasion for national thanksgiving and rejoicing. The Council of the Royal College of Veterinary Surgeons at their last quarterly meeting decided to send on behalf of the profession an address of congratulation to His Majesty on this occasion. All our readers, we can assure the Council, will acclaim of one accord their action. No man or woman in our profession but will wish to express the most heartfelt devotion and loyalty to the Sovereign. His reign already has covered one of the most critical and momentous periods in the history of the British peoples. The throne of England has never rested more securely established in the confidence and affections of these peoples. Our vast Empire, we are told, is now bound together only through this common tie of allegiance to the King's throne and person. During the coming days we shall call to mind those qualities of the King's own person which have served his peoples through dangers and almost unparalleled difficulties. The sincere thankfulness of all his subjects in 1929 upon his recovery from serious illness is still fresh in their mind. It will be their earnest prayer that good health and godspeed may long be given him. These good wishes, too, will go out to Her Majesty the Queen and all the other members of the Royal Family.

At this time when untold millions of the King's subjects will vent their feelings in jubilant gratitude for the blessings of his reign, there will be mingled in the minds of those of his subjects who have lived to witness the succession of events in this period—a whole generation, in the usually accepted reckoning—a deep sense of contemplation of the changes wrought with the passage of time. The Great War of 1914-1918 will loom naturally as the outstanding episode of the period, assuring it, as we now think, lasting prominence in the recorded history of the human race. But individual subjects and communities within the Empire will be moved to reflect not only upon the great imperial and world events of the period but also upon what affects them perhaps more intimately, namely, the progress they have made in the discharge of their duties as citizens within a generation throughout which the personal contribution of the King has stood out as an illustrious example. The contribution of the veterinary profession to the service of the State in the War will, we believe, stand to its lasting credit. When the story of the achievements of veterinary science comes to be fully written, not the least deserving of the tributes to be recorded will be those which must be paid to the men who had brought about the establishment in the British Army of an authoritative organisation within which during the time of national emergency the profession could wield, as it did and to far better effect than in the armies of any of the other combatants, the special skill and knowledge at its disposal to reduce suffering and loss among the anima's of our fighting forces.

In this brief survey, however, we will not dilate upon our contribution during the war; some of the essential facts concerning the services rendered by the profession are appended in a note which follows. Rather we will endeavour to relate in their sequence a series of happenings which have taken place during this period, bidding well to characterize it as the beginning of a new era in the history of the veterinary profession in Great Britain, when there has come to pass a complete change of heart on the part of the State towards the progress of veterinary science. The official committees which have included as their members distinguished men of affairs, science, and medicine, as well as veterinary men, that have been appointed in the meantime by Government to enquire into and advise upon matters relating to veterinary science, such as veterinary research at home, the needs of the colonial empire in field and research workers, and the basic question of education, as represented by the enquiry into the state of the Royal Veterinary College, London, have castigated in chorus the past neglect of the State to make provision for the furtherance of this pursuit as amounting to a national disgrace and a discredit to any civilised community.

Let it not be thought when we stress the significance of this salutary turn in events that prior to the opening of this new era of State awakening to its long-neglected responsibilities the veterinary profession had stood still in the matter of adding to its store of scientific knowledge and failed to discharge to the public those duties which were entrusted to it when its members were constituted a body corporate by the Royal Charter of 1844. The greatest triumph in what may be called applied veterinary science that we have to record for this period has been the complete extinction of glanders from Great Britain and the suppression of this scourge of former wars to almost negligible proportions in the recent war. The fundamental researches upon which were based the essentially veterinary measures adopted to exterminate this scourge owed nothing in this country to Government support. They were completed long before there supervened a time when the relegation to committees of all problems that needed painstaking work and decisive action had become, in the words of the late Sir Stewart Stockman, "a disease of the age." They can be justly ascribed to the enterprise mainly of two great British veterinarians, one a scientist, happily still alive to contemplate the fruits of his long labours, Sir John M'Fadyean, and the other the accomplished and cultured clinician who was the founder of this journal, the late William Hunting, both of whom were at the zenith of their powers during the quarter century preceding that under review. The merits of this achievement may tend to be somewhat dimmed in the minds of the rising generation of veterinarians because of the immense reduction that has taken place within the period in the numbers of horses employed in road transport, brought about as this has been by a mechanical development which has been an outstanding phenomenon of the period, namely, the tremendous exploitation of the internal combustion engine. For the same reason, what has been quite recently achieved in the control of equine disease which formerly assumed serious economic proportions elsewhere in the Empire —such, for example, as the eradication of dourine in Canada, the chemotherapy of surra in India, and the determined attempts at immunisation of horses against horse-sickness in Southern Africa—may readily be overlooked.

Parenthetically, the observation may here be interposed that this mechanical revolution which at the beginning of the period boded the doom of the profession has been accompanied by one of the most curious paradoxes in the history of human institutions, namely, by an enormous widening in the scope of veterinary endeavour with resulting unprecedented increase in the numbers of students undergoing training at the veterinary colleges towards the close of the period.

In any event, extermination of a devastating disease of livestock nearly always brings to light a fresh set of problems, often of greater complexity, for the veterinarian, and each rising generation would do well to reflect that at no remote distance in time before the grant to us of our Royal Charter, modern veterinary science came to birth in Western Europe, with the opening of the veterinary colleges at the end of the 18th century, commencing with that at Lyons in 1762, for the purpose mainly of combating two great animal plagues that had inevitably followed in the wake of armies during the wars of that period: these were rinderpest and glanders. Both are now so completely extinct in this country that if a recent graduate were asked what were the two most important disease problems of our livestock he might well answer, tuberculosis and contagious abortion, with the confident assurance of one who felt that somehow these must be eternal problems. If the young graduate should chance to cast his career beyond the shores of the mother country his answer would soon be a different one, for he would find that in the Empire there are large territories in which the diseases that have long been eradicated from Britain are still rampant, and measures have to be employed often for their control, as for other unfamiliar diseases to be found also there, which are widely different from those which would be adopted in his home country. Taking the Empire as a whole he might well after some experience answer that the two most important animal diseases were not those which he would name at home, but rinderpest and piroplasmosis.

Outside the Empire, probably the outstanding triumph to record in this period has been the almost complete eradication of the cattle tick, the vector of the common tropical piroplasmosis of cattle, commonly known there as Texas fever, by our American colleagues from the southern states of U.S.A. This triumph has followed upon the classical investigations recorded by Theobald Smith and Kilborne in their monograph in 1893, coupled with the entomological researches of Cooper Curtice, and the pioneer work on preventive measures of Schroeder, Melvin, Mohler, and others, whose names are linked with what has been rightly called one of the greatest romances in research. Again, with the elimination of Texas fever within the territories freed from the tick there have come to light other problems which have called upon the resources of trained veterinary investigators; these problems have been chiefly helminth infestations, breeding troubles, and

plant poisoning, upon which solid advances in the devising of control measures have been made.

In the overseas empire, evidently owing to their disturbing prevalence and paramount economic importance, research into the diseases of animals had been prosecuted as part of the duties of the State veterinary departments for some time before the beginning of the period under review. In South Africa, following upon the shocks of the great rinderpest outbreaks of the late '90's and the threatened annihilation of the country's livestock still later by East Coast fever and other diseases, there has come into existence what has since been described as a model organisation for the above purpose; the output in research of the laboratory, centralized at Onderstepoort, in the Transvaal, after the Union, has long exceeded that of any other institute in the empire, and the annual expenditure incurred, which mounted some time ago to a figure not far short of the total now placed at the disposal of the Medical Research Council in this country, has been abundantly justified by the transformation of what was once a vast stricken territory into a prosperous land in which stock-rearing forms one of the great basic industries. It would be ungenerous, however, not to attribute this consummation largely to the personal qualities of Sir Arnold Theiler, as the founder and the inspiring and indefatigable head of the research division.

The Development Commission's Advisory Committee on Research into Diseases in Animals concluded in 1922, with regard to the state of affairs elsewhere in the overseas empire, that "in India immense opportunities are almost wholly neglected" and "leaving out of account the work done in South Africa, the state of research into animal diseases within the Empire is at present lamentable in relation to the opportunities available." This statement, made with the weight behind it of the distinguished scientists who served on that committee, is quoted because it may be taken to give a fair indication of what was the position until the middle of the period we have under review. The change that has taken place during the second half in several parts of the empire is striking. One of the most notable phenomena, judging from the published literature and contacts at home with visitors who have come over for training, is the rising of a young generation of keen veterinary scientists in Australia and New Zealand. There has been also a considerable amount of useful information placed on record by workers in our African dependencies, the work on virus diseases and helminths of the Kabete laboratory being especially worthy of mention. Of topical interest was the tracing in 1922, for the first time, of undulant fever in man to abortion infection in cattle in Southern Rhodesia by Bevan, who was already well known for his work on trypanosomiasis and horse-sickness. It is sincerely hoped that the reproach against the state of investigation into animal diseases in the colonies will soon be completely removed, when they recover from the financial depression which they have recently felt sorely, by contributing to put into effect the recommendations of the Lovat Report (1929), which are calculated to assure them a remunerative return for their outlay in respect to which South Africa stands as a shining example. The state of veterinary research in India was enquired into with some care by the Royal Commission on Agriculture in India (the Linlithgow Commission) 1928, and the report of this commission repays reading for a presentation of the peculiar difficulties confronting the veterinary scientist in that sub-continent. The great cattle disease of the country, rinderpest, is being attacked now, it seems from the reports to hand, in a manner which bids fair to achieve success in the special circumstances prevailing in the country, namely, by widespread inoculation of the relatively resistant native breeds of cattle with a strain of live virus attenuated by prolonged passage in other animals, of which the goat appears to be most suitable. It is encouraging to observe the considerable numbers of young Indians who have been sent for training in recent years at the home veterinary colleges; it is hoped that on their return they will be given further guidance and every facility to proceed to the investigation of the enormous problems in animal disease that await solution in their country.

State-subsidised veterinary research in the United Kingdom dates back only to 1910, the year of the King's accession to the throne. Before that year, a few grants had been made to official bodies appointed specially to conduct certain investigations, such as the Royal Commission on Tuberculosis (1901), and departmental committees on contagious abortion (1905) and swine fever (1896, 1910). Otherwise, except for the results of some researches undertaken at the veterinary colleges and a few other institutions out of private funds, the progress of veterinary science had depended on "the crumbs that fall from Continental tables." Before the war the annual grants paid to the veterinary colleges in France and Germany exceeded the whole amount made over to those of this country during the 120 years of their existence.

The beginning of this new era can be exactly traced to the signing by the King, a few days after his accession, namely on May 12th, 1910,

of the Royal Warrant establishing the Development Commission; the generously-supplied Fund placed at the disposal of this body at the instance of Mr. Lloyd George, then Chancellor of the Exchequer, to apportion with Treasury approval to institutions for the development of the economic resources of the country, of which agricultural development stood at the head of the list, represented at the time something entirely novel in our financial administration. There figures among the items allotted during the first year of the Fund a small grant to the Royal Veterinary College, London, for experiments on the vaccination of cattle against tuberculosis, and so, historically, these experiments would seem to deserve a special place in British veterinary science as the forerunners of what has now become a great expansion in investigational work rendered possible through the same kind of State provision. The first comprehensive British scheme of State-subsidised research in agricultural subjects, comprising among the twelve noted down those of animal pathology, animal nutrition, and animal breeding, is to be found in a published memorandum of the Development Commission dated March, 1911. At that time, the most difficult problem confronting the Commissioners was the provision of men trained to carry out research into the different subjects, as there were hardly any available, and so their plans, which were put into operation at once, made provision not only for the establishment of Institutes, where research into these subjects would be centred, and an advisory scheme, which was calculated to bring to the notice of farmers the benefits of research, but also a system of scholarships or studentships for the special training of qualified men to undertake research. These activities in fostering agricultural development were largely the outcome of the enlightened enterprise which Mr. Walter Runciman brought into his work as President of the Board of Agriculture and Fisheries, who further gave the Chief Veterinary Officer, the late Sir Stewart Stockman, his fullest support in erecting and equipping a first-class veterinary research laboratory from the resources of the Fund, while at the same time a similar laboratory was provided in Ireland.

These facts are stated here because we sometimes hear that research is an expansion in activity which is a post-war development—as if to imply that progress through experimental research owes its origin to war experience. It is clear that so far as British veterinary science is concerned, a vigorous start in this direction had been made some time before the war, and that with the early enlistment of all the young men who were under training as research workers, the scheme at its outset was exposed to a serious setback.

With some very rare exceptions, as in the case of the work done by civilian laboratory workers upon the classification of the sporulating anærobic bacteria, no lasting contribution to the advancement of veterinary science resulted in the countries of any of the combatants from the mobilisation of their resources for war. On the other hand, much research work of fundamental importance in progress was interrupted, and not uncommonly, as in the case of Gaffky and Lührs' brilliant studies on equine pneumonia in Germany, abandoned and until long afterwards overlooked. One of the epics in research of this war period was the manner in which the French workers, Calmette and Guérin, succeeded in concealing the calves they had under experiment at Lille in the course of their B C G investigations during the German occupation of Flanders. Good work was written up some time after the war by Minett on the diphtheroid bacteria found in the so-called ulcerative cellulitis which affected horses very commonly in war conditions. But, the war may well have provided a stimulus to the intensive general resumption of research, for, as is stated in the Tenth Report of the Development Commissioners, 1920, " During the course of the war most people in this country came to realise the strength Germany had gained through the attention her scientific men had given to the development of agriculture and other industries."

After the war, the Development Commissioners appointed the advisory committee, under Sir David Prain, already referred to, which they had contemplated setting up before the war to enquire into the special difficulties of getting men to carry out veterinary research; the conclusions of this committee can be foreseen from their review of the facilities then available in which they say that " having regard to the position held by this country in the stock-breeding world such a condition of affairs " (in which an aggregate subsidy of £3,696 had been given to the five veterinary colleges during the year 1920-21) " constitutes a national disgrace." At the time when this committee issued its report in February, 1922, the Government were forced to curtail public expenditure, but fortunately, a " windfall " was obtained for the purposes of agricultural research and education through the remission to the Development Fund of a large sum of money which was placed by Government at the disposal of the Commissioners under the Corn Laws Production Acts (Repeal) Act, 1921. The origin of this sum is worthy of special comment. Until this time, benefactions public or private for veterinary education and research had been notoriously few, those forthcoming having been obtained almost entirely from members of our own profession. The sum

forthcoming from the Act named above was one to which the farming community was entitled as compensation, but they elected through the National Farmers' Union to have it placed at the disposal of the Commissioners and so it represents a benefaction from them. It was from this sum that moneys became available for the endowment of a Chair of Animal Pathology at Cambridge University and for the building and equipment of the research institutes at Cambridge and the Royal Veterinary College, London. Another move of like significance was made in 1920 by the sheep farmers of Scotland —who as a class suffer more from losses caused by disease among their animals than the rest of the farming community—when they constituted themselves into an Animal Diseases Research Association and approached the Development Commissioners through the Ministry of Agriculture for funds to carry out research, which were duly granted subject to control of the work by an approved executive committee. The striking successes, in louping-ill research particularly, already obtained at the Moredun Institute which was built for carrying on the researches, encourage the hope that stock-breeders in future will have recourse more frequently in this way to the aids of veterinary science. Although it was not administered through the same channel, but through the Medical Research Council, the fund collected by the *Field* weekly periodical from dog lovers and sportsmen, for investigations into dog distemper will remain also, through the classic researches of Laidlaw and Dunkin, a lasting example of the benefits which the public may derive through judicious support given to well qualified research workers. Since 1924, the largest single item of veterinary research undertaken, from the resources of the Development Fund, has been the work on foot-and-mouth disease carried out under the direction of the Foot-and-Mouth Disease Committee of the Ministry of Agriculture and Fisheries.

This short review of the progress of veterinary science, so far as the administration and organisation of veterinary research are concerned with progress, must take account, as a final decisive development in the period, of the creation of the Agricultural Research Council by Royal Charter dated July, 1930. This body was designed to complete the scientific organisation for the supervision of subsidised research other than that already supervised or controlled by the Medical Research Council and Department of Scientific and Industrial Research. The Agricultural Research Council has so far laboured under difficulties, it seems, as compared with these latter bodies, because after its first meeting in 1931 fresh research activities had to be dropped because of the world depression and also because it started rather late in the field, when there was already in being an extensive organisation for agricultural research initiated under the scheme framed by the Development Commissioners in 1911, whereas the other bodies have themselves built up and now control the research institutes for which they are responsible. Only very small funds have therefore hitherto been placed at the free disposal of the Agricultural Research Council. Its activities, as disclosed in the first report of the Council covering the period from its establishment until the end of September, 1933, have so far been concerned mainly with a survey of the work that is being carried out at the research institutes, and from this survey it is clear that the members of the Council are becoming fast aware of the magnitude of veterinary research; exactly one-third of their report is concerned with the subject of animal diseases. As a short guide to recent research work in veterinary science in Great Britain the reader would do well to consult this portion of the report. According to a supplemental Charter, the Council is to consist of not less than 12 or more than 15 members, of whom not less than four or more than five are to be persons experienced or interested in agriculture and the others of persons appointed after consultation with the President of the Royal Society. The scientific pre-eminence of the Council is therefore assured. A number of veterinary workers serve on several of the sub-committees.

One of the most useful recent institutions for the furtherance of veterinary science in this country and the Empire generally has been the establishment of the organisation known as the Imperial Bureau of Animal Health. The inception of the scheme dates from a recommendation of the Imperial Agricultural Conference of 1927 to establish clearing stations for information in eight branches of agricultural science, of which one branch was Animal Health. Its functions were to "collect, collate and disseminate among research workers in the Empire information of a scientific and technical character; to reply to enquiries on scientific and technical problems . . .; and generally to facilitate intercourse among groups on closely allied problems." The two publications issued by the Bureau, namely, *The Veterinary Bulletin* and *Index Veterinarius* will eliminate many of the great disabilities under which British research workers laboured at the beginning of the period and will ensure that any original information of value that finds its way into the scattered literature and reports will be made readily accessible to workers, whether in well-equipped laboratories at home or engaged in field duties in remote parts of the Empire. In this connection, the central library facilities

placed within the reach of members of the profession by the War Memorial Library of the Royal College of Veterinary Surgeons have become invaluable.

The paramount place of education as given at the veterinary colleges is stressed in all reports of committees that have enquired into the position of veterinary science during the period under review. In face of the various changes in the demands made upon the veterinary graduate and of the strictures levelled against Government and animal owners for their neglect of veterinary science and of its own financial straits prior to the passing of the Veterinary Surgeons Act, 1920, the Council of the Royal College of Veterinary Surgeons must be admitted to have played its part gloriously in prescribing and maintaining a standard of education fitted to the changing requirements and thereby to have fully justified the "one-portal" system of entry to the profession that came about with the Veterinary Surgeons Act, 1881. The report (1929) of the departmental committee on the Reconstruction of the Royal Veterinary College will remain to bear witness to what has been—never to recur, as we have now good reason to hope—the shameful neglect of our educational institutions.

We have not attempted to catalogue the fresh additions to knowledge that have been made during the period of His Majesty's reign. They would cover much space to set out properly, and some of the older workers might then indeed be inclined to think that the number of striking discoveries has not been large compared with those made in the preceding quarter-century—a period which has been referred to as the Homeric age of microbiology. But although spectacular findings may not have been so common, steady research work has brought light to bear on several problems about which we were in ignorance at the beginning of the period. Undoubtedly, the finest work has been done through the closer impact of the more exact sciences upon the problems of biology. The rapid growth of biochemistry has been unquestionably the most striking feature of the period, and the massive literature on the vitamins, enzymes, mineral metabolism, and hormones testifies to the industry of workers in this pursuit. This new knowledge has been of immense value to veterinary medicine in the way it has helped us to look afresh at several problems such as those of milk fever, lactation tetany, osteoporosis, rickets, some forms of sterility, and some anæmias—even though we are not commonly called to treat cases of diabetes or pernicious anæmia the treatment of which by products derived from the above studies has constituted two of the most striking triumphs in human therapy. Generally, pathology has assumed more and more a comparative aspect, and there has been a closer association between workers studying the problems of human and animal disease. Several examples could be given of this tendency, especially in the field covered by the virus diseases, which on account of the fact that the viruses are not cultivable artificially in the manner of the bacteria demand animal observations extensively for their study. The recent studies on influenza, in which strong light has been thrown on its probable etiology by observations upon a naturally-occurring pig disease, are illustrative of these tendencies. In the older field of bacteriology there have been good illustrations too of the value of comparative study. At the beginning of the period (1912), it may be recalled, a method was discovered of cultivating the bacilli of Johne's disease, somewhat fortuitously it would now seem, by the association of a young veterinary surgeon (Ingram) at the Brown Institution with a medical researcher (Twort) there who was at that time endeavouring to find means to grow leprosy bacilli. The story of the discovery of the relationship of human undulant fever and bovine contagious abortion is now well known. Valuable information in regard to the methods to be employed in the study of the sporulating anærobic bacteria capable of causing disease in animals was derived from the work done on human gas gangrene during the war. A great deal has also been done in the systematic classification of bacteria and helminths, which has rendered more easy their study. For example, we now realise that our knowledge upon the important bacteria which we class as Salmonella was rather chaotic at the beginning of the period. In the field of immunology, the striking work of the young French veterinary investigator Ramon upon the anatoxins or toxoids of the tetanus and human diphtheria bacilli is worth recalling. The studies of Arkwright and others on bacterial variation and the conspicuous immunological significance of the variations are also worthy of note. In protozoology, the most striking advance has been in our better understanding, largely as the result of the studies of the brilliant French parasitologist Brumpt, of the relationships of the great Theileria genus of piroplasms and of the massive rôle of these parasites in the acclimatization of cattle imported into tropical and sub-tropical countries. The remedial treatments of the helminthiases has made enormous strides through systematic research carried out by M. C. Hall and several other workers. A great extension has taken place in laboratory work upon the baffling problem of cancer consequent upon the discovery of the veterinary

scientist, C. O. Jensen, that certain kinds of it found in rats and mice can be readily propagated in these animals by implantation of the living tumour cells under the skin; during the period under review much interest has been aroused by the finding of Rous in America that in the case of some tumours which occur in fowls transmission can take place by inoculation of cell-free filtrates of the tumour-cells; and, again, very recently, the suggestive finding has been made by Ledingham and Gye that these filtrates contain "elementary bodies" similar to those found in the lesions of cow-pox and fowl-pox. The diseases of the lesser domestic animals bred for economic purposes have assumed a significance in this country to the veterinarian out of all proportion to that obtaining in regard to them at the beginning of the period: fowls and their diseases and, to some degree, fur-bearing animals and their diseases are now factors meriting real concern in the national economy.

Finally, if we have not stressed the value of the clinical work done in the period, in which there has been a striking general improvement in the standard accomplished, it is not because we have overlooked the essential importance of this older side of the art of the veterinarian. We may repeat here what was said recently concerning a great teacher of human medicine (Sir John Rose Bradford), in writing about the difficulties he had to encounter in the early part of his career: "The great clinical tradition of the English school needs no apologist to-day, for the truth that medicine is an art, indebted to many sciences, but wholly dependent upon none, is everywhere being acknowledged." The Medical Research Council has recently made a strenuous endeavour to bring clinical research under systematic study in a manner similar to that employed for experimental research into the problems of preventive medicine, and "clinical units" under whole-time research workers or teachers have been established for this purpose. The clinical teachers at our veterinary colleges, unlike those at most of the medical schools, have, however, nearly always been whole-time men, whose attention has not been diverted from their work by the preoccupations of private practice. Deprived as they have therefore been of the means of supplementing what have been their meagre emoluments and thrown into intimate contact with their students in the exercise of heavy routine teaching responsibilities, the older teachers now alive who have taught in the splendid practical tradition of clinical teaching at our British colleges may be assured that their graduates throughout the Empire cherish for them feelings of lasting gratitude and respect, an assurance which may now serve them in some measure as a partial recompense for their sacrifices. Good work undoubtedly has recently been done in advancing veterinary clinical knowledge, particularly in X-ray diagnosis and anæsthetics, and there has been very evident progress in small animal surgery and therapeutics, brought about by the enormously increased public demand for the services of veterinary practitioners to treat the ailments of dogs and cats kept as domestic pets. It gave general satisfaction when the first award of the Dalrymple-Champneys prize for the best work of the year was made last year to one of our younger clinical teachers for the excellence of his work on anæsthetics.

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ADDENDUM

The Veterinary Profession in the Great War

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The veterinary profession played its part well in the Great War, both graduates and students offering their services to the Government in various capacities. It is estimated that, taking into consideration the number of members over age for military service, approximately 60 per cent. served with the Royal Army Veterinary Corps.

In 1914 the Royal Army Veterinary Corps consisted of 362 officers and 208 other ranks (*Official History*, p. 27), with approximately 53,000 animals. In consequence of the continued expansion of the Forces in the Field and the increased number of animals employed it became incumbent to increase the resources of the R.A.V.C. till at one period there were 1,306 officers and 41,755 other ranks to care for all animals, which at one time amounted to the enormous total of 1,000,000 in all theatres.

Veterinary units, etc., required on the outbreak of war were:—

Veterinary Hospitals ...	6
Mobile Veterinary Sections ...	11
Base Depôts Veterinary Stores	2

The increases in the forces necessitated, not only substantial increases to these units, but the creation of new veterinary formations as a result of experience; thus the number of units for the Expeditionary Force increased to:—

Veterinary Hospitals	31
Indian Veterinary Hospitals ...	2
Camel Veterinary Hospitals ...	4
Convalescent Horse Depôts ...	6
Veterinary Evacuating Stations ...	20
Mobile Veterinary Sections ...	83
Indian Mobile Veterinary Sections	11
Cavalry Mobile Veterinary Sections	15
Veterinary Laboratories	3
Base Depôts of Veterinary Stores ...	6
Advance Base Depôts of Veterinary Stores	1

Further, Reserve Veterinary Hospitals had to be formed and maintained at Home.

The shoeing of all animals was also placed under the administration of the R.A.V.C., with the result that several Schools of Farriery were established.

Again, it was also found necessary to maintain a large number of Veterinary Officers in India.

It will thus be seen that the veterinary profession gave of its utmost in endeavouring to alleviate the sufferings of the animals. Out of a total of approximately 2,400 veterinary surgeons on the Register available for military service and to carry on the extra work entailed in their civil spheres, it was at one time extremely difficult to meet the many demands made on them by the Veterinary and Remount Services, etc.; in fact, the shortage was so acute at one period that veterinary establishments had to be reduced in numbers and ultimately it was deemed desirable—indeed, became absolutely essential—for students serving in the ranks to be released in order to return to their studies to enable them to obtain their degree and thus become available for commissions in the R.A.V.C., so meeting the serious situation to some extent.

All particulars of the various theatres of war can be found by the interested reader in the *Official History of the War, Royal Army Veterinary Services,* but it can be said here that members of the profession served on all fronts; anywhere where animals were used there would be found some veterinary personnel.

Whatever may be the future of the veterinary profession in future wars, if any, the lessons learned from the last one are put on record for all time and may be of great assistance to those who come after.

AVERAGE ANNUAL STRENGTH OF ANIMALS IN EACH THEATRE OF WAR

Period.	*Theatre of War.*	*Animals.*	*Average Strength.*
August to December, 1914			
	Home	Horses and Mules	97,543
	France and Flanders	" "	107,085
			204,628
January to December, 1915			
	Home	Horses and Mules	208,312
	France and Flanders	" "	222,326
	Egypt	" "	51,381
	"	Camels	1,115
			483,134
January to December, 1916			
	Home	Horses and Mules	168,298
	France and Flanders	" "	379,613
	Egypt	" "	57,216
	"	Camels	27,005
	Salonika	Horses and Mules	60,523
	Mesopotamia ...	Horses	
	" ...	Mules ...	51,755
	" ...	Bullocks	
	" ...	Camels	
			744,410
January to December, 1917			
	Home	Horses and Mules	138,033
	France and Flanders	" "	436,121
	Egypt	" "	71,765
	"	Camels	46,334
	Salonika	Horses and Mules	85,792
	Mesopotamia ...	" "	63,968
	" ...	Camels	2,939
	" ...	Bullocks	4,534
	Italy...	Horses and Mules	28,858
			878,344
January to November 11th, 1918			
	Home	Horses	88,897
	"	Mules	12,501
	France and Flanders	Horses	304,341
	" "	Mules	92,195
	Egypt	Horses	60,547
	"	Mules	53,805
	"	Camels	40,126
	Salonika	Horses	19,609
	"	Mules	45,327
	Mesopotamia ...	Horses	36,969
	" ...	Mules	44,095
	"	Camels	2,494
	"	Bullocks	4,378
	Italy...	Horses	15,900
	"	Mules	6,322
			827,506

SUMMARY

Year.	*Average Strength.*
1914	204,628
1915	483,134
1916	744,410
1917	878,344
1918	827,506
	3,138,022

As regards the more serious contagious diseases, that scourge and despair of all connected with horses, glanders, was practically non-existent in the British Armies, in spite of the fact that the animals were often brought into contact with those of others, which were not so fortunate in this respect. This splendid achievement, together with the insignificant outbreaks of other contagious diseases and their prompt treatment and eradication, can only be attributed to the unceasing care and foresight of members of the profession.

THE ECONOMICS OF FEEDING THE COMMERCIAL HORSE*

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This paper is not, of course, of such importance as when the horse *was* transport and transit and the feeding of large studs of animals was a whole-time task, requiring considerable experience, and was often of a worrying nature.

Dividends generally depended on the cost of forage. It was not customary for the veterinary surgeon to have charge of the granary and the various outbreaks of sickness we had that were mainly due to food supplies will be remembered by many.

Anthrax was at times fairly frequent, various forms of poisoning, twists, ruptures, and colic were common and considerable numbers were lost from azoturia, etc. One was not able to charge these losses to the other department—they were a veterinary matter and it was often pointed out how much money had been saved by the buying of a certain article. If all losses were charged that were caused by the injudicious purchase of unsuitable or damaged food material, it would be more costly in the end.

The death rate from colic in many hard-worked studs in the past was between 2 and 3 per cent. and although to-day one can take a certain amount of credit for the better feeding of horses and the lower death rate from bowel disorders, which in my stud is between ½ and 1 per cent., one should certainly take into account the fact that the work horses do to-day bears no comparison with that done in the past.

The eight-hours' day has probably saved thousands of horses from fatal colic and, further, the intervention of the motor has practically eliminated long journeys and animals are not brought into the stables exhausted.

Economic feeding consists in obtaining the greatest amount of work at lowest cost. Good food must accompany hard work and neither should be disproportionate. It is difficult to state whether too much or too little of either is the worse. One cannot deal with feeding with mathematical precision: what is excessive for one animal is not so for another. Therefore careful selection of foods and well-judged methods of proportion are essential to economic feeding.

Tabulated statements on the cost of feeding are useless unless the amount of work done, the condition of the stud, and the death rate from bowel disease are taken into account.

It is an easy matter to cut down the cost of feeding for a period, but an expensive task to get a working stud back into good condition that has become poor; no amount of food can compensate for work done beyond a certain point, as an excessively tired animal cannot assimilate the food. Condition may be described as that state of the body in which it is capable of performing the greatest amount of work, with the least fatigue, a proper balance between food and work being maintained.

Food may be defined as a material which, when eaten, is used to build up and replace tissues of body, keep up body temperature and apply energy for work. It should be palatable, wholesome, easy of digestion and there should be extraction of deleterious material.

Again, economic feeding is also much dependent on efficient stable management, *e.g.* horses should have a reasonable time to feed before leaving the stable, and a good and plentiful water supply, while the condition of the stable, bedding and ventilation all have their effect.

Many experiments have been conducted to calculate the energy of food and expressed in starch equivalent, but attempts to feed working horses entirely on these lines would be highly unsatisfactory; one has to consider the various weights drawn, the speed and the condition of weather and road.

Foods are usually studied under the following heads.

(1) Chemical composition.
(2) Heat units.
(3) Digestibility.
(4) Requirement of animal to work.
(5) Cost.

(1) *Chemical Composition.* — This varies largely, depending on harvest, age of material, condition of storage.

(2) *Heat and Energy Units.*—Important constituents are proteids, carbo-hydrates, fats, fibre, salts.

It is well known that it is necessary not only to supply the above constituents, but to supply them in certain ratios according to work done. The nitrogenous ratio is the amount of digestible proteid matter compared with carbo-hydrates and fat, and 1 lb. fat = 2·3 carbo-hydrate.

It is desirable when large numbers of horses are fed, to work out the ratio; the ideal is 1 to 5 or 6 carbo-hydrate, but to-day, when there are few horses that are overworked either in pace or loading, I am quite contented with 1–6 or 1–7 ratio.

In this connection, I have collected rations of many firms keeping large numbers of horses and it is rather creditable to find that the nitrogenous ratio of most of these rations is about 1 to 6. I am certain that these had not been worked out, which tends to show that the feeding in most cases is done in a practical and economic manner.

It has been demonstrated that any excess of carbo-hydrate over 10 to 1 protein means that some digestible part of food is wasted.

* Paper presented to a meeting of the Central Veterinary Society held at Conway Hall, W.C.1, on April 4th, 1935.

A proportion of crude fibre is of little use in nutritive value, but is necessary for bulk and to stimulate peristalsis.

Salts are usually present in sufficient quantity in drinking water and food for vital functions. Common salt, however, improves the appetite and is said to increase the flow of digestive juices.

Digestibility.—Some foods require so much energy for their digestion that little is left for external work. Zunty found that with wheat straw, when fed to horses, according to its composition 100 lb. should give 18·1 starch, but it cost the equivalent of 29·7 starch to digest it; there was, therefore, a direct loss of energy.

Experiments have been made and all the data necessary for calculating the digestibility of food are available. They are the only means by which a knowledge of the way any of the given food is utilised by the animal body can be obtained. It is impossible to separate the digestible portion of a food from the indigestible by chemical methods except in the case of crude fibre.

Maintenance.—It has been almost agreed, as a result of many experiments, that the diet of a horse weighing 1,000 lb. (9 cwt.) should be equal to 7 lb. digestible starch. It is well known that speed is a most important factor; Grandeau found that 19·4 lb. hay kept a horse in condition when walked 12½ miles a day, but that 24 lb. was insufficient when the animal trotted the same distance.

If an extremely low proteid ration is given to horses at rest, more proteid material is excreted than is given in food and muscular wasting occurs.

About five-twelfths of a working diet is said to be sufficient for maintenance. Although experiments show on how little a horse can be kept, I consider it necessary to give resting horses considerably more than the above: they are inclined to become weak and take considerably longer time to get into condition again.

Cost.—Feed for horses has, for some considerable time, been very reasonable and even to-day is not much above pre-war rates; that is, of course, exclusive of labour. Part of the rise has been due to a duty on imported oats of 8s. 7½d. qr. Owing to the importation of Canadian and Norwegian hay, when the home supply is short or inferior, the market seldom reaches extraordinary values. The supplies of the above are fairly constant and often a boon where big quantities of graded quality are required. When a particular cereal becomes excessive in price one tries another cereal or cereals equally productive at a lower figure. It is in this manner that large quantities of maize are being used.

Animals are usually graded as follows:

(1) Heavy horses—these animals should only be used for slow haulage: but should be capable of taking two tons.

(2) Trotting van horses.

(3) Light trade horses.

Quick-trotting animals should have a higher nitrogenous ratio. Work can be classed as light, moderate or severe.

Duration of work has fortunately become fixed for horses, as for carmen, but I regard anything above 20 miles a day as excessive; probably 100 miles a week would be a fair limit.

Nose-bag fed horses should have a slight increase in food owing to wastage. Animals that are not hard worked can have this food diminished by several pounds during summer months.

Suitable Rations.

Maize is not regarded by all horse-owners as a suitable dietary for horses and even to-day there are those whose knowledge of horses is extensive, who still refuse to use it. It is, however, the most economical cereal and it is now even more used since the duty was put on exported oats.

At a meeting of this Society in 1905 Mr. Rutherford, a veterinary surgeon of some considerable experience, said that maize was the most dangerous article of diet that could be introduced into the stable. How could they, he asked, account for the constantly recurring outbreaks of colic, ruptures, and twists, unless it had some specific property capable of producing bowel disease? He stated that even draught horses receiving more than 6 to 8 lb. per day were in the danger zone and that 12 to 14 lb. was fatal.

Personally, I am in total disagreement with the above statement and could give details of several studs whose only cereal is maize and in which the death rate from bowel troubles compared very favourably with that in others where maize was not used. I do agree, however, that if one is feeding principally on maize one should be careful over the hay or straw fed with it. New hay or straw will soon set up bowel disorders, especially with maize.

Damp or wet maize soon undergoes fermentation. We have been feeding extensively on maize during the last twelve months, some animals having as much as 14½ lb. per day and with no higher death rate from colic than when fed on oats. Colic, in my opinion, is principally due to the hay supply and this explains the variation one gets with bowel disorders. Maize is an energising, heat-giving and fat-furnishing food and it is said that animals like it for the oil it contains; it is rich in carbo-hydrate. It is low, however, in crude protein and is said to lack the amino-acids necessary for animal growth; also it is low in minerals, especially calcium. These deficiencies are corrected by supplying mixtures or leguminous hays, in the case of working

horses. Varieties are white and yellow; the latter is said to contain much more fat-soluble vitamin than does the white; as a rule it contains less than 10 per cent. moisture: it will spoil if containing more than 14 to 15 per cent.

In order, if possible, to refute some of the statements that maize is a dangerous dietary, the following observations are made: during 1932 the cereal of a dietary consisted of five-sixths maize and one-sixth oats—the death rate from colic was 0·21; during 1933 the dietary was two-thirds maize and one-third oats—the death rate from colic was 1·2; during 1934 the dietary was four-fifths maize and one-fifth oats—the death rate from colic was 0·62. The death rate was lower when the largest proportion of maize was used.

Oats are well known to be the ideal feed for horses if no economy is necessary. Probably in big studs the plate oat was most extensively used; they were fair average quality, and generally in good condition. Since the duty on imported oats was imposed, the English and Scotch varieties have been much more in use, being of much better quality and almost competitive in price. The husk of the oat is said to average about 20 per cent. and has only the value of straw. For feeding, oats should be about two to three months old before use. Oats exceed maize in crude protein; the husk gives them such volume that the animal rarely suffers from "gorging": they form a loose mass which is easily digested, whereas maize tends to "pack."

Beans and Peas.—These are highly nitrogenous and useful for excessively worked animals. More than 3 lb. day is excessive.

Barley.—This has been used as a cereal at various times, in conjunction with maize and oats, when price allowed and as is the case with maize, there is a very varied opinion of it, although it is stated by some authorities that its limit should be up to about one-fifth of the whole corn given.

Malcolm, in 1894, carried out a feeding experiment with barley, which consisted of the following rations:

Hay	13 lb.	Hay	13 lb.
Beans	3 ,,	Beans	3 ,,
Maize	8 ,,	Maize	8 ,,
Barley	8 ,,	Oats	8 ,,

and proved beyond dispute that it was a suitable food without harmful effect. He advised the use of this cereal when the price was economical. In 1902, barley was largely used in our stud, but the price of late years has not warranted its use.

Bran, or Wheat Offal.—This, to-day, is an excessively dear diet and can easily be dispensed with; in the summer and spring it can be replaced by greenmeat and, during winter, hay can be used. Its feeding value does not compare with the price; it is, however, useful as a laxative. It has a further disadvantage in that if it is put in sacks with other forage, and gets damp, it soon sours and taints the food.

Dried Grains.—These are said to be an economical substitute for oats and are extensively used by some. By analysis they are said to contain over 70 per cent. crude protein and twice as much fat as bran, but they are lower in carbo-hydrates. They are bulky.

I have had no personal experience of extensive feeding with dried grains, but for the purpose of this paper they were given a trial as follows:

Four horses which had a dietary of 16½ lb. corn (three-quarters maize and one-quarter oats) and 15½ lb. chaff, were weighed and then fed on 13½ lb. corn (three-quarters maize and one-quarter oats), 3 lb. grains, and 15½ lb. chaff.

These animals were only on a walking job and were in good condition and weighed about 14 to 15 cwt. They were kept at the same work when the corn was replaced by grain. Their weights were taken again in about four weeks and the following losses in weight occurred: Horse No. 1, 27 lb.; No. 2, 28 lb.; No. 3, 47 lb., and No. 4, 36 lb.

Although I do not consider this as conclusive evidence against the feeding of grains, owing to the short time the animals were fed on them, they are not to be recommended, to my mind, for hard-worked animals; their price, although cheaper than that of oats, is dearer than that of maize. *Cost.*—Grains about £5 10s. per ton; oats about £7 3s. 6d. per ton; maize about £5 3s. 6d. per ton.

Hay and Mixture.—The value of hay depends on the variety of grasses and condition. Soft hay is wasteful for cutting purposes and horses do not seem to relish it as chaff. It is usual to use about two-thirds hay and one-third mixture for chaffing purposes: mixtures consist of lucerne, sanfoin and clover. Poor and damaged hay is, in my experience, the main cause of colic, especially low-lying meadow and reedy hay, lacking in herbage and digestible fibre; it is usually bulky. The best hay for use with maize is timothy and rye grass. Canadian hay is usually of standard quality, mostly timothy, and in good condition.

Oat Straw.—Owing to its large fibre content and low value for production for work, little straw can be fed to hard-worked horses; if however, they are doing slow work 10 to 30 per cent. can be given. Winter oat straw is best.

Preparation of Foods.—One cannot, in a short paper, describe the working and devices used in the cutting, cleaning and mixing of forage. The main objects of such preparation are the removal of damaged material, dust, dirt and foreign bodies, and the supply of rations ready for consumption.

Corn is sifted and crushed, and mixed with other cereals in the proportions required. It is correctly weighed and sent out in sacks, with instruction as to number of days' feed.

[The essayist proceeded to give (not for publication) details as to composition and costs of several rations in use in big studs. Granary costings were excluded, however, on the ground that it would be unfair to compare costs which vary widely, depending on premises, plant, number of horses fed and overhead charges.]

In conclusion I should like to add an expression of my indebtedness to Professor Woodruff for a book written on this subject many years ago; it has been of great service to those seeking information. Whilst not claiming to be a dietetic expert, it has been part of my duties to supervise a granary which once fed several thousands of horses. I feel sure that there are many statements in the essay which will not appeal to all, but I trust they will make a groundwork for discussion on practical feeding.

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Discussion

Mr. J. W. McIntosh, in opening the discussion on the foregoing paper, said:—

I am very pleased indeed to have the opportunity and the privilege of opening the discussion on this very interesting and important paper. My old friend, Mr. Jones, is to be congratulated on his very excellent and practical contribution, the value of which is much enhanced because it is a record of his own experiences in the management and control of what was at one time, probably, the largest stud of commercial horses in this great city. Practical observations and experiences of this kind, when based on scientific reasoning, and true physiological grounds, are invaluable.

Having recently contributed a few observations on this subject it is not my intention to say very much, and as I find myself in agreement with all that has been so well said by Mr. Jones, I will confine myself to a few general observations.

In this new age, when the psychology of the times appears to be very largely mechanical, there is, I am afraid, an unfortunate tendency for the student of to-day to neglect that clinical study of the horse and his requirements, which was the distinguishing note of veterinary training in the past. Indeed, it is quite possible and even probable that we have with us to-night a number who would be much more interested in a paper on the economics of motoring or on the feeding of dogs and cats. While not denying that these, too, might be interesting, the earnest student of veterinary matters would do well to realise that the most valuable preparation for veterinary practice must for all time centre round the horse and all that appertains to his well-being, and any specialisation, whether it be work in the field or in the laboratory must follow. I venture to think that the most fallacious of all judgments is a diagnosis unchecked by sound clinical knowledge and experience. Neither can we limit our veterinary activities to the mere treatment of diseases, or even to the prevention of the spread of epizoötic and enzoötic maladies. Constant and recurring losses arise from causes which we *can* help to control, and amongst these, perhaps, no single factor exercises a greater influence than that associated with nutrition.

The correct feeding of animals then, is not only of the utmost economic importance, but is also of immense significance in the prevention of disease.

An intelligent understanding of foods and feeding stuffs, and their functions in the metabolism of nutrition is essential if we are to expect the best results: You must know what foods are best suited to the needs of the body, in what form and quantities these should be given, and be able to ascertain how the best feeding can be obtained at the least possible cost and risk. You must be well acquainted with all available food supplies, and be in a position to appreciate the uses of their ingredients. Such knowledge is of service in enabling you to select foods, which may be at any time in a favourable position on the market. You can very often effect economies in this way by substitutional methods without any loss of body equilibrium or efficiency, and this is, as you all know, important in all commercial undertakings.

Standard diets are in use in all well-regulated stables. These have been reinforced and added to by investigators who have had the inclination and the opportunity of studying in close detail their effect, under the many and varied conditions which apply in the work of transport. There *can, of course, be no fixed standard,* as you can readily understand, as conditions of work, size, age, pace, activity, weights to be drawn, etc., must be taken into account and catered for. Nevertheless, with due recognition of these various factors, the main question remains, *viz.,* how far the usually accepted standards are correct. Does the average horse, doing an average amount of work, require the quantity of proteins, or, for that matter, of total nutrients that the ordinary dietetic standards call for? Can the real physiological needs of the body be met by reducing the protein intake? and so on.

From a long experience in a similar capacity to Mr. Jones, I am convinced that in the

majority of cases the protein level is too high and that nitrogenous equilibrium can be maintained by reducing the intake, with actual gain to the body and without loss of strength, endurance and vigour.

Any excess of protein, beyond what can be made use of, is frequently the cause of trouble. We see the evil effects of uric acid in gout, and there are many other waste products of proteid katabolism which, with excess of proteid foods, are liable to be unduly conspicuous in the fluids and tissues of the body and may do more or less damage prior to their excretion through the kidneys and other channels. I am quite satisfied that the vast majority of horses, in the employment of people of means, are overfed and then with disappointing results. Notwithstanding the fact that there is now a large amount of information available from both scientific and practical sources, it is surprising how many there are, who will cling to the old way of doing things, with the result that there is economic loss to themselves, and very often discomfort and even suffering to their animals.

It is no exaggeration to say that thousands of pounds are wasted annually by injudicious methods of feeding. Habit and sentiment play such a part in our lives that it is too much to expect any sudden change of custom. Let us hope that by a proper system of education it may be possible to arouse a little more interest in a subject which promises fruitful and economic results and I would urge the need for further research and investigation, by our research workers, on the question of feeding horses under the varying conditions which apply to the work of transport.

A great deal of very excellent work has been done by our research workers in connection with the feeding of animals, if we except the horse. Certain dietary standards have been recommended, but no very serious attempt has been made, in this country at any rate, to put them to the acid test of effect under the varying conditions which apply in the working of a commercial stud. This is very surprising in view of the enormous importance of this branch of economics. As Mr. Jones says, "Tabulated statements are of little value unless the amount of work done, pace, conditions, incidence of disease, mortality, etc., are taken into account"—and with this I agree. Standard rations are of use only as a basis around which one must form one's own judgment, when put into practical use. It is obvious that there can be no fixed standard as conditions vary so much, but under reasonable working methods these can be met by judicious blending of mixtures. The food selected should be clean, wholesome and of good quality; the hours of feeding regular and so on.

With regard to ratios, my own experience bears out that of Mr. Jones. Some minds will favour one ingredient as compared with another, and all are not of the same value in the metabolism of nutrition when blended with others, but within narrow limits there is no very appreciable difference so long as the balance of the whole is maintained. I am of opinion, however, that the tendency is to compound mixtures on a too high *protein* level, in the belief that the higher the nitrogenous level the greater the efficiency and the greater the resistance to disease. These views require further investigation. My own experience, over a long period, is rather against these beliefs. If the protein is in excess of what is actually needed, it clogs in the system, gives rise to a sense of fatigue, loss of energy to the body in handling and getting rid of the surplus requirements, to say nothing of the danger of intestinal putrefaction and toxæmia, kidney trouble, etc. An excess of carbohydrates, while unnecessary, and uneconomic, is not anything like as dangerous, as it can be stored in the body in the form of fat, and this up to a point, is desirable.

Mr. Jones does not believe in the value of experiments expressed in terms of starch equivalents. I should like to ask why? Crude fibre, while of little value in nutrition, has an important physiological action, which cannot be wholly disregarded. Straw, while of little nutritive value, is sometimes useful for horses doing slow work if additional bulk is needed. Mr. Jones said that maize is not regarded as a suitable dietary by some horse owners. It will not be denied that oats in themselves are perhaps the best balanced of all cereals and the most popular when the question of economics is not seriously considered. Experience, however, has proved that maize, when judiciously blended with other ingredients, is one of the most valuable and economic of cereals and can be used with excellent results when fed to heavy horses up to 14 lb. a day, provided there is sufficient fibre to prevent packing and that the ratio of 1 to 6 is maintained. In horses doing fast work the ratio has to be narrowed, while in horses doing slow work at a walking pace, 1 to 7 will suffice. The actual ingredients, if of good sound quality, are not of such vital importance as the compounding of a suitably balanced ration provided the digestibility of the whole is kept at a level equal to the minimum requirements of the body.

[Mr. McIntosh proceeded to give details of some of the mixtures fed to the horses under his control and the economic effects of substitutional methods when markets were favourable. He expressed disagreement with Mr. Jones' experience in the use of grains. For many years they were used extensively in their mixtures and he thought he could claim, with excellent results. The stud on the whole was in excellent working condition, the incidence of disease was low and

the death rate from colic was under 1 per cent.]

Concluding, Mr. McIntosh said: "I will not detain you any longer, as Mr. Jones has covered this ground very well, and I am sure all will agree that he has given us a most valuable and interesting paper." (Applause.)

Professor W. C. Miller asked to be allowed, in the first place, to thank the Society for the privilege it had conferred upon him in electing him to membership that evening. Unfortunately, his delayed arrival had deprived him of the opportunity of witnessing his election and also of hearing the greater part of Mr. Jones' paper, but there were some things that he desired to ask the essayist, whom he hoped would forgive him if he spoke without a clear understanding in consequence of the circumstance to which he had referred.

The first point was that Mr. Jones had mentioned that he preferred oat straw made from winter oats to oat straw made from spring oats as a feeding material for horses. He thought it was the case that the winter oats had a greater time in which to lay down lignin and therefore the straw was richer in fibre and had less soluble carbohydrates than had straw made from spring oats, which had a shorter growing period and therefore had not the time to accumulate fibre.

Another point which occurred to him was that if one assumed that the digestibility and chemical composition of barley and oats were roughly equivalent, it stood to reason that one could not substitute 1 lb. of brewers' grains for 1 lb. of oats, since in the process of producing the brewers' grains, part of the starch in the endosperm had been converted into soluble sugars. In practice, he thought they would surely expect from such a substitution to find some reduction in body weight and condition.

There was a third point which he thought perhaps it was of some value to mention. Quite recently research workers had been coming to the conclusion that it was not so much the quantity of the protein that mattered as its quality; if one took, for example, the protein of maize, zein, it was not one of the proteins that could be made use of by the animal body; for the best results one must include the essential amino-acids — tryptophane, lysine, cystine, arginine and histidine. He thought it was generally assumed that that was why beans, for one thing, had such a great value as a protein food; they were richer in tryptophane than the cereals.

He did not wish to presume to any great experience of feeding commercial horses, but since coming to London from Edinburgh he could not help but mention that he had not seen horses with the same amount of condition and degree of fitness that they seemed to have in Edinburgh—probably because of the harder work the London horses had to do, the pace at which it was done and the longer journeys involved. He just mentioned that, not as a challenge, but as an observation. (Laughter.)

Mr. W. Perryman observed that it gave him great pleasure to say a few words in support of the paper presented by their old friend, Mr. Jones. Mr. Jones, of course, had done wonderful work; Mr. McIntosh had backed him up, and between the two he thought they had carried all before them. They had been able to carry out a system of feeding which, for the general practitioner, was almost impossible. Moreover, they had had at their command the ability to buy on the market at favourable prices, and there was no doubt that under these circumstances it was a good plan to feed the different elements and proportions they had heard that night. He agreed with much that the essayist had said, but the general practitioner was up against a very different problem. He went into the stable, perhaps a big one, only to find that they had neither the storage, the men, nor the plant requisite to carry out that routine of feeding that they had had so ably put before them that night. In general practice they found that the owner had to do the best he could, that he was rather averse to innovations and, further, that it was often very difficult to offer advice; for example, it was of no use to talk a lot about such rationing as they had heard that night. The system of feeding he had found suitable for London, generally, was that the horsemaster should get the best of food and, in particular, that he should give plenty of corn. He thought the ideal method in London was to stick to oats and give the best that could be obtained. The difficulty he had found in general practice was to get the owners to give enough corn; one part corn to three parts hay—a common ration—was not sufficient; one wanted to increase to an almost equal proportion of corn and hay. A system often carried out in London was to give one part of corn, one of bent grass and one of clover; that was a good proportion, but the corn factor might, with advantage, be increased.

As to the quantities, he went rather higher than either Mr. McIntosh or Mr. Jones. For a big cart horse, doing general rough work and perhaps having to cover 30 miles a day, one wanted not less than 40 to 42 lb. of feed, corn being the larger factor. That sounded high, but that was his experience. There was one thing that he was surprised to hear from Mr. Jones, and he thought also from Mr. McIntosh, and that was as to the ration of beans. Mr. Jones said that he gave as much as 3 lb. of beans; he (Mr. Perryman) thought 1 lb. was sufficient for any horse, when combined with a good oat diet.

He had found that one of the most common causes of colic was a sudden change of diet, particularly when changed from a clover to sainfoin ration—horses liked the latter, and no doubt ate it ravenously—in one large stud some years ago the owner had the fad of giving one month clover and one month sainfoin. He always knew when the sainfoin was being used, from the number of colic cases. He had had three cases on hand at the same time, and believed them to be due to sainfoin. He quite agreed with Mr. Jones, and Mr. McIntosh emphasised the point, that no amount of food would do good to an animal if worked beyond a certain stage; physiological functions could not be carried out when a horse was overworked.

He did think that the veterinary surgeon should take a great interest in the loft; he should frequently pop up there and have a look round, because the master was apt to get into a routine way of feeding and leave it altogether to his men. He had had little experience of the feeding of grains. One client of his, himself a grain merchant, took to feeding his horses on grain, and they looked horrible. He would like to ask Mr. Jones if he thought that the steaming or rolling of grain had any effect upon the nutritive value of the food.

To revert to the different quantities of food, he had already mentioned that the heavy horse should have from 40 to 42 lb., and he thought

the light vanner should have 36 lb., cobs and small horses, 24-28 lb. daily.

He was sure they were very much indebted to Mr. Jones, and also to Mr. McIntosh, in introducing the discussion of a subject which was to him, personally, of very great interest; he was confident that they would all benefit greatly both by the papers and by their subsequent consideration of them.

Veterinary-Colonel G. Rees-Mogg said that he had been much interested in hearing those papers from the two greatest experts in London. As regards Mr. Perryman, his remarks on sainfoin were quite wrong; he knew a big trainer on the Downs who fed his race horses on nothing but sainfoin as he had found it the best hay. The speaker had fed maize a lot during the last ten or twelve years—not only to his own riding horses but on his farm to his cattle and sheep as well. Formerly he used to buy whole maize, but he had found that it sometimes heated and also there was the expense of crushing it, so now he always bought cooked flaked maize. This was an excellent food but was deficient in calcium and phosphates and one had to make it up with bran and fish- or meat-meal when feeding it to stock. Those of them who were with him in America would remember the acres of maize they saw everywhere, this being given in the green state; it was a great food in America and Canada.

One speaker that evening had talked about grains not being equal to barley; surely no one ever thought that it was. The one "crab" to maize was that in the summer it sometimes caused a slight humour in some horses. Mr. McIntosh had spoken of the dangers of giving excess of protein to horses. In America a German read a most interesting paper on sterility and he proved with figures that the more proteins one gave to cattle the higher the sterility, and he (Colonel Rees-Mogg) had given much less proteids lately.

As regarded giving maize to horses, owing to it being low in calcium and phosphates, he gave it in conjunction with bran, and beans, of which he gave hunters 3 lb. a day when in hard work.

Sir Frederick Hobday made reference to the cleaning of the food of London horses, giving as an instance that fed to the 120 horses in the Borough of Kensington. At one time they were much troubled with calculi but, following the installation of a machine containing a magnet, which extracted from the fodder all those little pieces of metal that were the foundation of calculi, that trouble ceased entirely, whereas they used to lose two or three horses a year from that cause.

Proceeding, Sir Frederick said that they had with them that night Señor Yoviano of Brazil and he would like to hear what that gentleman had to tell them about the feeding of maize, which was a standard diet on the estancias and in the towns also, of the Brazilian horse.

Señor R. Yoviano having expressed his gratitude at the opportunity of being present and of hearing so excellent a paper on the feeding of horses, said that he was particularly glad to hear the remarks made about the feeding of maize, because in his country, although they did not have very heavy horses, they used horses all over the country for riding and the only feed that they used in Brazil was maize and a little green grass when they could get it—and they had horses second to none. The maize, they found, must be very dry; they never used green maize or maize from the same season.

Their heavy work was done by mules, which were fed entirely on maize and were perfect. They used the yellow maize, because they found it was richer in minerals and probably richer in protein than was white maize. In their horse-breeding districts they always used yellow maize.

Professor G. H. Wooldridge observed that sufficient had already been said about the papers given them by Mr. Jones and Mr. McIntosh and he could not contribute anything beyond what these gentlemen had said, because of their enormous experience. Mr. McIntosh had pointed out that the albuminoid ratio was made too high in many cases; he thought it should be emphasised that Mr. McIntosh was referring particularly to draught horses doing slow work; a higher albuminoid ratio was desirable for horses engaged in fast work. A great mistake was often made by horsemasters when horses were doing extra work, in increasing the nitrogenous ratio. He preferred an increased ration of the balanced food. He might refer to the use of maize alone. As they had already heard, maize was frequently used by itself and he had had experience of a stud of horses in which no other grain was used. It was rather interesting to contrast that with the effect of gram in India where one had such a high albuminoid ratio; the interesting thing was that horses in such different parts of the world could thrive and do equally well on such widely varying ratios.

It was, however, the economic aspect of that matter that had to be considered. In this country maize was deficient in the ordinary way in albuminoids, and that deficiency could be rectified by the judicious admixture of beans—1 of beans to 8 or 10 of maize—that combination would give one an albuminoid ratio resembling oats. Of that mixture, owing to its higher digestive co-efficient, one could give 6 lb., which would give the equivalent of 8 lb. of oats. Having cut down the total ration, one might have to increase the bulk again with hay or some equivalent. That brought him to the reference Mr. Perryman made to the use of clover or sainfoin; there again it was a question of adjusting the balance of the ration. He thought that a far better way for general commercial purposes was to use a mixture of either clover, sainfoin or lucerne (alfalfa) one truss, with good hay two trusses.

Colonel Rees-Mogg had mentioned that he was now using flaked maize for some of his stock. He (Professor Wooldridge) did not know if the question of the digestibility of cooked maize as compared with uncooked maize for horses had been worked out, but Professor Wood, of Cambridge, had shown that for pigs the digestibility of uncooked maize was about 80 per cent. and that when it was cooked the digestibility was raised to over 95 per cent.; the speaker believed it to be a very economical procedure to use cooked maize for horses.

Captain R. J. Stow said that he noticed that both Mr. Jones and Mr. McIntosh fed all hay as chaff, but he had always been told that one should feed long hay at night; was their objection to feeding long hay purely an economic one?

As regarded maize, he went to a farm the other day and the carter was grumbling because he was only able to get maize gluten for his horses, saying that his animals were doing badly and were getting greasy legs. Would it be better if those horses were to get some beans as a substitute for some of the maize gluten?

Dr. J. McCunn commented that both Mr. Jones and Mr. McIntosh had dealt with the subject from the economic point of view and there was

no doubt that by following their tenets a good deal of money could be saved, but he had had a good deal of experience of a rough class of work and it was his belief that horses could eat anything and do well. Four of the best-conditioned he ever knew belonged to a pig breeder and he fed them on his pig swill; those horses were quite capable of doing their work and were quite fat; he did not think that there was any hay or any horse corn on that man's premises.

There was no doubt that Mr. Jones wished to get a lot of credit for the diminution in alimentary disease due to his scientific way of feeding, but he thought that had very little to do with it. At one time he was unfortunate enough to be involved in a contract with Mr. Jones' firm and he had no doubt that those horses were scientifically fed, but before the eight hours day came in they were continually troubled with colic cases; he remembered one week when he was up every night and he was glad when Mr. Jones withdrew the contract. (Laughter.) Alimentary troubles in horses were mostly due to dirt; there was no doubt that the new machinery that had come into vogue in modern times had stopped colic to a great extent, but it had had a detrimental effect on the chaff cutters because these men suffered from lung disease due to the dust if they were unprotected.

In feeding of horses or any animals, if one was thinking of the animal itself, there was a lot of high-falutin' nonsense talked, just as there was about the feeding of people: people who fed in the ideal way were no better and no stronger than those who lived in the East End and fed the wrong way—probably the latter were stronger. (A member: "The survival of the fittest").

Continuing, Dr. McCunn said that there were many ways in which stable management could come into use in the economic feeding of horses. The man who first invented the manger ought to have been put into a lunatic asylum. The horse had a long neck and was meant to take his food from the floor. He could take them to a large stable in London where that system had been adopted; the horses were weighed every month (that was another method of controlling their feeding) and the condition of those horses had improved, as also had the economics of feeding at that place; with these 400 horses the method saved 1 lb. of corn per horse per day, representing four quarters throughout the stable and this at £1 a quarter amounted to a saving of about £1,500 a year.

There had been a lot of discussion concerning grains. A year ago he went to see a stud of horses in which they had trouble with the animals "dropping"—very similar to the dropping trouble met with during the War—and he immediately enquired as to their feeding. Their veterinary surgeon was with him and the forage manager started to tell him (Dr. McCunn) how the horses were fed. He was surprised to hear that corn appeared to have been completely replaced by dried grains. He immediately started to say what a bad thing this was and that no doubt most of the trouble was due to this, but the receipt of a kick on the shin from the veterinary surgeon made him think again and he desisted; he thought there was something behind it. It appeared that the man responsible for the rationing was greatly in favour of dried grains; his horses looked extremely well and he had under his charge somewhere between two and three thousand. Ever since that time he (Dr. McCunn) had held his peace about the scientific feeding of horses. To sum up; he thought that as long as the horses got enough they could eat almost anything—eliminate dirt and one was safe.

Captain Macdonald, having complimented Mr. Jones on his very able paper, added that he would also like to compliment Mr. Bywater on having secured him, because when he was Hon. Secretary of the Society he spent twelve long years, without any effect, in endeavouring to do so. (Laughter.) He believed that on the last occasion upon which Mr. Jones read a paper to that Society the German Government considered it of such importance as to drop a bomb on the building; providentially it missed Mr. Jones. (Laughter.) Nevertheless, they ought to hear more of him. (Hear, hear.)

He would like to ask the essayist if he did not think that heavy feeding on maize predisposed to grease. Of course, that did not apply to Brazil, where the horses were of a lighter and cleaner-legged type, but with Shire and Clydesdale horses he thought it did tend to do so.

He also wished to ask Mr. Jones whether he varied his feeding according to the work of the horses and not altogether to the type; he thought it was a very important thing to study the individual horse as far as possible—not simply to have a certain ration which every heavy horse received, but to group the animals in the stable according to the type of work performed. For example, horses on local work doing a small daily mileage could keep their condition on a lighter diet than those working on loads between the Albert Docks and the City.

He was very pleased to hear Dr. Miller giving the Edinburgh horses "a boost"—as a native of Edinburgh he appreciated it—but he did not think their superior condition was due to any better horsemastership, but merely to the very different type of work they were called upon to perform, and the fact that in Edinburgh the driver never hustled them; in his view the asphalt paving of London took a lot out of the horses, as did the frequent halts in traffic.

Mr. H. C. P. King enquired whether in the essayist's opinion the watering of horses before, during, or after feeding had any particular effect. He would also like to know whether Mr. Jones thought that there was any period of the year when colic was more prevalent than at other times, and whether he associated any such increased incidence of colic with dietetic errors.

Was there any foundation for the allegation that maize produced fatty degeneration of the liver?

Dr. W. R. Wooldridge, while congratulating Mr. Jones on his excellent paper, put in a plea that he should write up his experiences in greater detail, giving the composition of the various diets used, the duration of their feeding, the number and type of animal fed and figures for illness including any exostoses that develop. In this way the profession and the science of nutrition would greatly benefit from the experience of such veterinarians as Mr. Jones, who held the few important positions looking after the well-being of large numbers of horses. Such a paper would be invaluable to scientific workers who were engaged on the problems of nutrition.

Professor McCunn, in his entertaining contribution to this discussion had told them how on one occasion he had been prevented from advocating certain scientific opinions because of a friendly kick on the shin. It was, perhaps, somewhat surprising to find that the best argument to use in a scientific discussion with Professor McCunn was such a prehistoric retort. (Laughter.)

There was one question he would like to put to Mr. Jones. He, personally, had always been struck by the comparative paucity of vitamins in the food of horses; yet, so far as he knew, no regular feeding of vitamin-containing foods was given to horses. He wondered if that was due to the fact that experienced gentlemen such as Mr. Jones thought that they were unnecessary for the adult horse; if that was so, were they equally unnecessary for the growing animal?

The Reply

Mr. Jones, commencing his reply to the discussion, said that, as Captain Macdonald had observed, the last time he had read a paper before that Society was during the War and it was on the subject of rationing horses. He was intently reading his paper when something went off overhead and, when he looked up, the room was nearly empty—he was almost wishing that something of the same sort had happened that evening. (Laughter.) He thought, however, that they had all very effectively answered each other and had left very little for him to say.

He would like to thank Mr. McIntosh for coming there and opening the discussion so admirably. Mr. McIntosh had said very little about the paper, but he had stated that he understood him to say that he did not know which was the worse; excessive proteid or excessive carbo-hydrate. What he had said was that it was difficult to know whether too much food or too little was the worse. Brewers' grains he had never tried, for several reasons; one was that they were a waste product, and, rightly or wrongly, he had always looked upon a waste product as a sort of "sucked orange." Another reason was that he had a strong suction plant at his establishment and if brewers' grains were put in it many of them would go up into the dust rooms. Thirdly, he did not think they were worth the money.

Mr. McIntosh had said that his deaths from colic were less than 1 per cent. and he put it down to this feeding of grains with maize; he (Mr. Jones) had not been feeding grains with maize but his death rate also was less than 1 per cent., so he thought that ruled that out.

Professor Miller was asking about oat straw. He (the speaker) always thought that the winter oat straw was finer than that of the spring oat: he supposed the lack of sunshine made it grow less strong. Professor Miller had said that 1 lb. of grains was not sufficient to replace 1 lb. of oats: he quite agreed, but if one was going to buy 2 lb. of grains to replace 1 lb. of oats it was absolutely uneconomical, and it was the same with barley. As to the quality of proteid, he was afraid that was not his line. Finally, he thought Professor Miller had better go down to Hay's Wharf where he would probably find some horses in better condition than they were even in Edinburgh.

Mr. Perryman had mentioned exclusive feeding on oats, but he (the speaker) did not advocate feeding all maize: if Mr. Perryman's clients were satisfied, good luck to them. (Laughter.) They must remember that with some commercial firms they got questions asked as to comparative costs. If one took a moderate stud of 500 horses on those rations that he had placed before them that night the difference between an all-oat and an all-maize dietary was 2s. per week per horse. He was not advocating that everybody should feed on maize: he thought that unless one was careful of the hay supply with it there might be trouble. "Cart horses 40 lb. a day": his horses were having 38 lb. a day and it was Mr. McIntosh's contention, and it was also his, that maize was a more economical feed than oats and beans. Mr. Perryman had expressed the opinion that 3 lb. of beans was too much: he thought that one could feed 3 lb. of beans without any trouble. Cooked maize might be very satisfactory, but the trouble about this cooked stuff was that one could not be absolutely certain that it was good maize.

Captain Stow had asked if he fed the hay long or chaffed; they fed it chaffed because, for one reason, one could feed mixture and hay together by that means in the proportion of two-thirds hay and one-third mixture; furthermore, feeding hay by itself was a wasteful method because horses got it under their feet and a certain amount had to be thrown away. Maize gluten he had not seen, so he could not give any information about it.

In reply to Dr. McCunn, he did not understand how you could take 1 lb. of oats per day off a horse merely by making it perform the extra work of stretching out its neck to feed off the ground. He presumed that Dr. McCunn's horses got more dirt than oats and that, consequently, they got on better than his (Mr. Jones') horses did from feeding on ordinary stuff.

Dr. McCunn had said that he (the speaker) had taken credit to himself for his method of feeding having saved horses from colic. He had done no such thing. He said, emphatically, that the eight hours day had saved thousands of horses from colic; he did not say that he had saved them with his ration, and he thought that if he wanted to lose a few he would try Dr. McCunn's system. (Laughter.))

In reply to Mr. King, the question of when to water was a very old chestnut. Watering horses, he thought, was very important, and in an infirmary he thought the only way was to have the water in front of the horse in a special bucket, because one could not have a horse in an infirmary going from one place to another in consequence of the risk of catarrhal infections, etc. In commercial stables, however, he thought the best way was to have their horses take their turn at the trough. In his time he had seen a good deal of suffering caused through horses watering from pails, or not being watered, perhaps, if the carter was tired and in a hurry to get home. He did not think there was any danger at all in watering from troughs.

Mr. King had also asked if feeding on maize caused degeneration of the liver: he had not seen any cases of that condition for a good many years, though he used to do so. He did not think there was any particular time of the year at which colic was more prevalent than others.

Dr. Wooldridge had said that he might publish rations and results. When one was in this work all day one did not think it was so interesting to other people; moreover, firms did not like to disclose to everybody else their rations and costings; but if at any time any one present was sufficiently interested in them, he should be only too pleased to give him all the assistance and information in his power. (Applause.)

Lincolnshire Red Shorthorn Association has decided to amalgamate with the Shorthorn Society in accordance with the terms of the agreement adopted by the council of the latter body. The effect of the decision is that Lincolnshire Red Shorthorn cattle will in future be accepted for entry in Coates' Herd Book.

ANNOTATION

Cost of Feeding Army Horses*

In normal times, and in pre-war days, the cost of feeding an army horse on a scale of diet at 10 lb. oats and 12 lb. hay works out at 7s. 3d. per week.

During the Great War, 1914-18, costs ranged very much higher, the reason bearing relation to the difficulty of getting food-stuffs, their increased cost, freightage, and high rates of insurance against loss of conveyance by steamships. Towards the end of the war in France and Belgium, with an army at that time of approximately 260,000 horses and mules, cost of feeding was assessed at 7s. per horse per day, and if the war had gone on much longer it would have been 10s. per horse per day. £130,000 per day food-stuffs for an army in the field represents a heavy drain on a country's resources, and would tend to make nations think seriously on embarking upon other conflicts. It is certain that it is a deterrent element so far as Great Britain and the British Empire is concerned.

* Annotation by Major-General Sir John Moore in respect to Army Horses, arising out of Mr. H. D. Jones' paper (published in this issue) on "The Economic Feeding of the Commercial Horse," read before the Central Division, N.V.M.A., on April 4th, 1935.

LIVERPOOL ANIMALS' CLINIC

An April 10th, Sir Frederick Hobday, Principal and Dean of the Royal Veterinary College, London, declared open new premises for the Liverpool Animals' Clinic. The building, which is situated at Larch Lea, Anfield, replaces smaller premises and has cost £1,750 to erect and equip. It is conducted by the Liverpool branch of the R.S.P.C.A., in association with the Merseyside practitioners.

The Lord Mayor, who was accompanied by the Lady Mayoress, presided, and was supported by Lieut.-Colonel P. J. Simpson, D.S.O., T.D., F.R.C.V.S., of Maidenhead, a member of the Council of the R.S.P.C.A.; Mr. F. J. Winchester, secretary of the Liverpool branch; Mr. C. W. Hesketh, hon. treasurer; Major M. P. Rathbone; Mr. Ronald White, M.R.C.V.S., hon. secretary of the Merseyside Veterinary Committee; Dr. J. D. Hayward, and Mr. Henry Sumner, Sen., M.R.C.V.S., Liverpool's oldest veterinary surgeon.

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KING'S HERD ATTESTED

The King's herd of 67 Dairy Shorthorn and Jersey cows at the Royal farms, Windsor, has been awarded a certificate of attestation under the Ministry of Agriculture's scheme for giving official recognition to herds free from tuberculosis.

* * * * *

At the first world dog show at Frankfurt an English brown cocker spaniel, Woodcock Memory, bred by Mrs. McIntyre in England and owned by Mme. L. van Herwaarden, of Mydrecht, Holland, was awarded the prize of the King of Sweden and the honorary prize of Herr Hitler "for the best dog of the show."

Clinical Communications

CANCER OF THE ŒSOPHAGUS IN THE CAT

HENRY GRAY, M.R.C.V.S.
KENSINGTON

Of all the domestic species the cat is most prone to cancer of the œsophagus. It occurs mostly in cats over seven or more years of age. It is rarely seen in younger animals, but a case was encountered a few weeks ago in a cat said to be only five years of age.

Complaints are made by owners that although the animal seems eager for food he rejects it almost as soon as he has swallowed it and the returned food is often streaked with blood. This has been going on for two or three weeks before the case is brought to the notice of the practitioner. In the meantime it has been treated for a gastric attack by the owner or a "quack."

On inspection of the pharyngeal region, during the time the tongue is drawn forward nothing is noticed or when the finger is passed into that region nothing abnormal is felt. On manipulation of the cervical portion of the gullet a resisting body about the size of a small bean may be encountered, sometimes in the upper, middle, or lower third of that organ, but as often as not nothing unusual attracts notice. On passing the probang there is a resistance to its progress at the place where the hard lump is felt, but where nothing is observed the probang may reach as far as the entrance to the thoracic cavity just between the two first ribs before resistance is met with. This intrathoracic situation is where cancer is most frequently encountered. In the majority of cases the probang does not pass by the obstruction, but in those in which, by the exercise of some force, it does so, there is just as great a difficulty in withdrawing it. In some few instances the sponge at the end of the probang when withdrawn from the gullet is smeared with blood.

When the gullet is opened and the finger introduced the obstruction is, in the case of cancer, found to be rough and more or less firm and often giving a horny or warty sensation to the touch. When the nature of the obstruction has thus been ascertained, and while the animal is under the influence of chloroform, consent is obtained from the owner and destruction is carried out.

These malignant growths, when submitted to Dr. Murray, the Director of the Imperial Cancer Research Fund, or to Dr. Hare, have been proved to be epitheliomata, sometimes undergoing a keratinizing process.

When an aged animal has œsophageal obstruction the practitioner should suspect it to be of

a cancerous nature. In younger animals the trouble may be due to a fish bone, a bonnet pin, a needle, or to a large cylinder of matted hair. This last is usually found in the post-cardiac region of the gullet, and the probang makes little or no impression upon it. In such there are frequent attempts to vomit and no appetite.

Animals with œsophageal cancer have not, as a rule, wasted very much, this no doubt being due to the fact that they have swallowed some food, which has reached the stomach before the obstruction has almost obliterated the lumen of the œsophagus.

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URINE ANALYSIS

N. S. KING, M.R.C.V.S.
AND
OLGA UVAROV, M.R.C.V.S.
Leatherhead, Surrey

Following the publication of Professor Boddie's paper on "The interpretation of urine analysis in diagnosis" in the issue of *The Veterinary Record* of February 23rd, 1935, we forward a series of case records having a bearing on this subject. The twelve cases submitted have been chosen as those being, in our opinion, most typical of those in which urine analysis was of great assistance. Unfortunately, *post-mortem* examinations have not been permitted in all cases.

Case No. 1.

Subject.—Two-year-old spaniel dog.

History of Illness.—Inappetence, dullness, vomition. No thirst or diarrhœa at first. Mucous membranes very injected. Urinous smell from the mouth. Temperature subnormal.

Urine Examination:

Colour—pale.
Reaction—acid.
Specific gravity—1010.
**Albumin*—(*a*) boiling —
(*b*) sulphosalicylic acid ±
(*c*) nitric acid ±
Sugar —
Bile (salts and pigment) —

Acute nephritis was diagnosed and the patient was given alkalies and the usual diet prescribed.

The urine of this dog was re-tested in a week's time, when the amount of albumin present was twice the quantity noted on the first test (*i.e.* albumin +). In another week's time the albumin content went up to double plus. By this time ulcers began to form on the gums and the tongue. Treatment was continued—alkalies, stimulants, very light mainly milky diet; warmth; mouth washes for the gums.

After three weeks' illness the patient began to brighten up; the amount of albumin started to decrease at first to one plus, then plus over minus; the specific gravity increased, and after six weeks' treatment the urine test revealed normal specific gravity and complete absence of albumin, the patient having made a good recovery.

* These three tests have been used, throughout this series, for the detection of albumin.

Case No. 2.

Subject.—Eleven months spaniel dog.

History of Illness.—Dullness, thirst, inappetence. Temperature subnormal.

Urine Examination:

Colour—normal.
Reaction—acid.
Specific gravity—1030.
Albumin +
Sugar —
Bile —

Acute nephritis was diagnosed. Patient responded to treatment. The urine was re-tested in three weeks' time after the onset of illness, when it was normal.

Case No. 3.

Subject.—Eight-year-old terrier dog.

History of Illness.—Dullness, thirst, and very pronounced urinous odour from the mouth.

Urine Examination:

Colour—golden.
Reaction—acid.
Specific gravity could not be taken, as sample obtained was too small.
Albumin ±
Sugar —
Bile —

Sub-acute nephritis diagnosed. Patient responded to treatment. In three months' time a second attack set in, in which test the

Specific gravity was 1010
Albumin + +

The condition was now a chronic one. In addition, urinous ezema developed. Patient again responded to treatment, but in three weeks he fractured one of his legs and was destroyed. *Post-mortem* showed chronic nephritis.

Case No. 4.

Subject.—Sixteen-year-old spaniel dog, having a bad heart (mitral regurgitation) and an anal tumour (suspected adenoma).

History of Illness.—Dullness and thirst.

Urine Examination:

Colour—dark.
Reaction—acid.
Specific gravity—not enough urine.
Albumin + +
Sugar —
Bile —

Chronic nephritis diagnosed. Patient responded to treatment and made a fairly reasonable recovery.

Case No. 5.

Subject.—Nine-year-old Airedale dog.

History of Illness.—Sickness and depression; occasional thirst.

URINE EXAMINATION:

Colour—dark.
Reaction—acid.
Specific gravity—1025.
Albumin ±
Sugar —
Bile (*a*) salts —
(*b*) pigment +

Subacute nephritis was diagnosed with suspected degeneration of the liver. The urine of this individual was re-tested 16 days later when the following was found:

Colour—dark.
Reaction—neutral.
Specific gravity—1030.
Albumin ±
Sugar —
Bile (*a*) salts —
(*b*) pigment + +

The patient became weaker and was eventually destroyed.

Post-mortem examination revealed all the changes of subacute nephritis with extensive fatty degeneration of the liver.

Case No. 6.

Subject.—Seven-year-old Cairn dog.

History of Illness.—Progressive nervousness; condition maintained at first; later on, occasional fits, patient being quite bright between fits.

Urinous odour of the breath and pain over the lumbar region led to a suspicion of nephritis, which was confirmed by testing the urine. As the condition progressed, thirst, vomition and inappetence developed and the fits became more frequent; the gait became stilted.

URINE EXAMINATION:

Colour—normal.
Reaction—acid.
Specific gravity—1015.
Albumin +
Sugar —
Bile —

This patient made fairly steady progress, but the fits became more frequent and he was destroyed; unfortunately the owner would not allow a *post-mortem* examination.

Case No. 7.

Subject.—Nine-year-old mongrel dog. Previous history of having had rheumatism on several occasions.

URINE EXAMINATION:

Colour—golden.
Reaction—alkaline.
Specific gravity—1030.
Albumin +
Sugar —
Bile —

Cystitis was diagnosed and the patient responded to treatment. Microscopical examination revealed bladder epithelium.

Case No. 8.

Subject.—Two-year-old Welsh collie dog.

History of Illness.—Sudden in onset, rapid loss of flesh; great thirst. Although the condition was very acute, urinous odour of the breath developed within two days of onset of illness.

URINE EXAMINATION:

Colour—pale.
Reaction—acid.
Specific gravity—1015.
Albumin +
Sugar —
Bile —

Acute nephritis diagnosed. Patient responded to treatment.

Case No. 9.

Subject.—Five-year-old Sealyham bitch.

History of Illness.—Had been getting thin and dull for the past six weeks, with variable appetite.

Examination revealed subnormal temperature; urinous odour from the mouth, pain over lumbar region.

URINE EXAMINATION:

Colour—watery.
Reaction—acid.
Specific gravity—not enough urine.
Albumin + +
Sugar —
Bile —

Chronic nephritis was diagnosed. Patient became worse and in a few days after the examination started vomiting blood and died in a state of uræmia.

Post-mortem was not allowed.

Case No. 10.

Subject.—Eight-year-old Airedale dog.

History of Illness.—For the past few weeks the patient was dull and occasionally sick. Normal temperature, urinous odour of the mouth.

URINE EXAMINATION:

Colour—pale.
Reaction—acid.
Specific gravity—1010.
Albumin + +
Sugar —
Bile —

Chronic nephritis was diagnosed, and the animal destroyed.

Post-mortem.—This revealed all the changes of chronic nephritis. The left kidney contained a cyst, involving a third of the circumference of the kidney, and containing a certain amount of fluid.

Case No. 11.

Subject.—Eight-year-old terrier dog.

History of Illness.—The patient was fairly bright, but in the past few weeks had been unable to eat biscuits or toast. The gums were very injected and a very slight urinous odour was apparent.

URINE EXAMINATION :

Colour—pale.
Reaction—acid.
Specific gravity—1015.
Albumin +
Sugar —
Bile —

Subacute nephritis was diagnosed. The patient is responding to treatment.

Case No. 12.

Subject.—Nine-year-old Airedale dog.

History of illness.—Gradual weakness ; loss of appetite.

URINE EXAMINATION :

Colour—dark.
Reaction—acid.
Specific gravity—1030.
Albumin + +
Sugar —
Bile (*a*) salts —
(*b*) pigment + +

Acute nephritis with some liver degeneration was diagnosed. This was confirmed by *post-mortem* examination, the liver having undergone extensive fatty degeneration.

HUGHLINGS JACKSON CENTENARY

On April 4th, 1835, Hughlings Jackson was born in the village of Green Hammerton, Yorkshire, and a hundred years later, on the same day, a company of neurologists, including several who had known him personally and had been his disciples, assembled in London to do honour to his memory. The commemorative dinner was organised by the Section of Neurology of the Royal Society of Medicine, and the guests included two original members of the Neurological Society of London, of which Jackson was first President—namely Sir Thomas Barlow and Sir William Hale-White.

Hughlings Jackson has justly been described as "the deepest thinker in neuropathology of the past century" and his unsurpassed contribution to the science of medicine, which is only now receiving its due meed of appreciation and acknowledgment, is the more noteworthy in that his methods of study were entirely clinical, being carried on long before the introduction of experimental methods of investigating the functions of localised areas of the brain and of the subordinate parts of the central nervous system.

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The Committee of the A. Chauveau Foundation has recently awarded the prize in veterinary science to Mons. C. Dubois, director of the veterinary services of Gard, for his work on undulant fever in animals.

Abstracts

[**The Operative Treatment of Colic.** DOENECKE, H., and BEHRENS, L. (1934.) *Tierärztl. Rdsch. 40.* 30.]

A case record of a horse brought in for obstinate obstructive colic, which had resisted medicinal treatment and could not be cured by a clyster.

A diagnosis of obstruction of the small colon was made and it was decided to treat it by intestinal massage performed through a laparotomy in the left flank. This was duly carried out on the standing animal with the aid of chloral hydrate and epidural anæsthesia.

The condition was verified and the affected part was massaged for about three minutes and the abdomen closed. The horse began to pass faeces four hours after operation and recovered completely under careful handling. It died three months later, however, from gastric impaction, and *post-mortem* examination showed that the earlier operation had been a technical success, but that the site of the impaction in the small colon was deprived of its mesentery for some twelve inches, which the authors believed to have been present at the time of operation. Four lipomata were situated on this part of the intestine and it was thought that they had developed, or at any rate grown considerably, since the date of operation. Beyond a thickened and reddened serous layer, the affected part of the small colon appeared to be normal both structurally and functionally.

J. E.

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[*Brucella abortus* **as the cause of Fistulous Withers and Poll Evil.** HIERONYMI, E., and GILDE, H. (1934.) *Zeit. f. Infektkr. d. Haust.* 47. 24-47. (35 refs.)]

Horses suffering from fistulous withers, poll evil or a combination of the two conditions were examined for infection with *Br. abortus.* In one group of such animals 87 per cent. of 65 reacted to the agglutination test. The numbers of animals appeared higher amongst those suffering from fistulous withers. In 14 instances a bovine strain of *Br. abortus* was isolated from lesions. Of a group of 105 normal horses showing no lesions at the poll or withers, none reacted to the agglutination test. [In England 5 to 15 per cent. of normal horses react to the agglutination test, the critical titre being 1 : 20. Data are not available to compare this titre with that of 1 : 100 adopted by the present authors, but undoubtedly 1 : 20 is the more severe test. This fact probably explains the apparent freedom of German horses from Brucella agglutinins. It must be remembered, however, that in this work the authors were

not concerned with the incidence of infection, but were comparing the presence or absence of active foci of *Br. abortus*. From this point of view they were perfectly correct in adopting a high critical titre.]

In the horse typical lesions contain a clear ropy or slimy, amber-yellow exudate including an immense number of rubber-like white or yellow bodies the size of orange pips. Histologically these bodies consist of a network of fibrin containing a granular material made up of fibrin and degenerated cells.

A tentative diagnosis of brucella infection can be made where typical lesions are to be found. The diagnosis must subsequently be confirmed by resort to the agglutination test of blood serum or exudate fluid, culture of exudate material, or an allergic test. Treatment is at present based upon surgical measures and the prognosis is always doubtful. For this reason experiments have been commenced on the subject of vaccine therapy, but complete results are not yet available.

E. J. P.

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[Traumatic Rupture of the Intercostal Muscle and Diaphragm in a Horse. Krassnitzky, A. S., and Frohmin, B. W. (1934.) *Tierärztl. Rdsch. 40.* 29.]

A case record of a pathological rarity in a heavy farm horse, which had been out at pasture.

Symptoms included a hæmatoma-like swelling on the left chest wall, slight lack of general health and early respiratory distress on exertion.

The wound was opened and explored and the presence of intestine was observed in an opening between the sixth and seventh ribs. On a diaphragmatic hernia being diagnosed the horse was slaughtered.

At autopsy the seventh rib showed a splinter fracture, the intercostal muscles were ruptured to the extent of about three inches and the ventral muscular part of the diaphragm showed a large opening through which the ventral diaphragmatic flexure of the large colon had become herniated. The left lung was collapsed.

The rib was evidently fractured on impact and the splintered end forced through the diaphragm. Both intercostal and diaphragmatic openings had been caused at the same time, as the healing process was at the same stage in both wounds.

J. E.

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[Cystic Ovaries and Twinning in Holsteins. Clapp, H. (1934.) *Corn. Vet. 24.* 4. 309-324.]

Observations are made on the breeding record of a herd of 150 Holstein cows from 1928 to 1929.

Twenty-two developed ovarian cysts, and five of them repeated the phenomenon, so making 27 cases in all. Twenty-six of these conceived after treatment but two of the latter were discarded on account of other diseases.

It is observed that:—

(1) Two were cystic prior to first conception.

(2) Ten were definite nymphomaniacs.

(3) Seven cases that conceived again had a cyst only once in the open period prior to the conception, the remainder being repeaters. Nine of the nymphomaniacs were repeaters.

(4) Thirteen cystics bore single calves (two abortions); seven cystics bore twins (one abortion); four cystics were (at eight weeks) diagnosed as having twins. Three of these bore singles and the other had not calved.

In two cases the result was unknown.

From the following table, it is concluded that ovarian cysts predispose to twinning, and that the closer the successful service to the time of rupture of the cyst, the greater the probability of twins resulting:—

	Percentage of Twins.
Cystic cows served within 35 days of rupture of last cyst	54·5
Cystic cows served later than 35 days of rupture of last cyst ...	23·0
All cystic cows	37·5
Remaining (non-cystic cows) ...	3·1

Results of Twin Conceptions:—

Nine of the total of 27 twin pregnancies ended in abortion.

Thirteen of the 17 twin-bearers which delivered normal twins at full time, failed to cleanse.

Three twin pregnancies terminated in the death of the cow.

[Brucella infection occurred only occasionally.]

Miscellaneous Observations:—

Triplets occurred twice (one cystic and one non-cystic). The pregnancies were terminated by abortion at 199 days and 93 days respectively.

The average gestation period was the same for single as for twin pregnancies.

E. W. A.

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[A Case of Degeneration of the Heart Muscle in an otherwise Normal Calf Carcase. (Trans. title.) Müller, J. (1934.) *Deuts. tierärtzl. Wschr.* May 5. 277-278. 3 figs. (5 refs.)]

A case of the above condition in a four-weeks-old male calf is described and the author mentions that in the months of March to July

this is not an uncommon finding in German slaughter houses. During life these calves may show marked respiratory symptoms caused by massive pulmonary œdema.

The lesions of this case consisted of yellow to greyish white areas; one such area measured 5 cm. by 1 cm. in the myocardium of the left ventricle and interventricular septum. The degenerated muscles had lost any affinity for stains and a well-marked inflammatory reaction was present in and around the degenerated muscle fibres. The author compares the lesion to a similar condition observed in foot-and-mouth disease and by other authors in hæmorrhagic septicæmia.

J. R. M. I.

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[**The Diagnosis of Anaplasmosis in a Herd of Cattle.** Garcia, I. (1934.) *Ann. Rep. Inst. Anim. Biol. Span. Repub.* Vol. 2. pp. 88-106.]

An outbreak of anaplasmosis in a herd of 17 bovines is reported. Twelve animals became affected, cases appearing at intervals of approximately one month and lasting from ten to 80 days. The diagnosis was confirmed by inoculation of two bovines with blood. In blood smears made from the natural cases and from the experimental animals, parasites, some central and some marginal, were noted in 40 per cent. of the red blood corpuscles. The facts that the parasites varied in diameter from 0·5μ to 1·2μ and that no mortality occurred, led the author to suggest that the disease is not exactly similar to that encountered in other countries. [0·5μ is generally accepted as the upper limit, but the fact that twelve animals survived does not appear to be unusual.] An appendix deals with the possible vectors in Spain.

R. S. R.

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[**Another Piroplasmosis in Spain: False East Coast Fever.** Garcia, I. (1934.) *Ann. Rep. Inst. Anim. Biol. Span. Repub.* Vol. 2. pp. 107-120.]

Difficulty was experienced in arriving at a diagnosis of a disease affecting a herd of 16 adult bovines. The symptoms were progressive emaciation, loss of appetite, diminution in the milk yield, anæmia (with a count of 700,000 r.b.c. at one period in one case) and enlargement of the precrural glands. Neither albumen nor hæmoglobin was detected in samples of urine, and all the animals recovered without treatment. Parasites resembling those of East Coast fever (*Theileria*) were found in a small percentage of red corpuscles. The scarcity of parasites, their morphology and the benign nature of the outbreak led the author to conclude that they were *Theileria mutans* (formerly known as *Gonderia mutans*), the causal agent of the disease which was at one time confounded with East Coast fever.

The author's view of the outbreak is that the infection had been a latent one and that the symptoms had been precipitated by changes in environment, climatic conditions and management, because the outbreak occurred one month after the herd had been transferred from another district. This is in accordance with the fact that *Theileria mutans* infection has been described recently in Italy, and in that country the discovery was accidentally made in the course of examination of blood smears for evidence of other diseases. Nevertheless, the disease may be of economic importance in Spain, where attempts to improve the livestock of the country frequently involve changes of environment.

R. S. R.

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[**Experiences with the new Local Anæsthetic Pantocain.** Hanel, R. (1934.) *Wien. tierärztl. Mschr. 21.* 17. 513-516. (8 refs.).]

A 2 per cent. aqueous solution of pantocain, applied to the surface of wounds in horses and dogs, produced complete anæsthesia without giving rise to poisoning or delay in healing.

Applied to the cornea, a 2 per cent. solution yielded complete anæsthesia, but produced a temporary lachrymation and faint opacity. These undesirable effects passed off in 30 minutes. The pupil was not affected.

5 c.cs. of 2 per cent. solution were accidentally swallowed by a dog (unspecified weight). Muscular incoördination, followed by opisthotonos and shallow respirations, occurred in 5 minutes. Recovery took place within an hour.

E. W. A.

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[**The Free Cell Constituents of the Œstral Secretion in the Bitch.** Witzigman, J. (1934.) *Arch. tierhlk. 68.* 4.]

The author examined microscopically the vaginal secretion of some 40 bitches during the œstral period and gives the results of five cases in detail.

Leucocytes were observed during the pro-œstral period, but were no longer present by the beginning of the actual œstrum. The end of œstrum was marked by a mucoid focus of secretion containing large numbers of leucocytes and débris of cells. Erythrocytes were not present in pro-œstrum, but occurred immediately afterwards during œstrum and were still to be found during metœstrum (the phase following œstrum itself).

The characteristic large epithelial cells observed in mice could not be found with regularity in bitches, many forms being present at different phases of the œstral period.

J. E.

N.V.M.A. Divisional Reports

EASTERN COUNTIES DIVISION, N.V.M.A.*

ANNUAL GENERAL MEETING AT NORWICH

Film Demonstration and Address by Dr. McCunn

The Fifty-ninth Annual General Meeting of the Society was held at the Royal Hotel, Norwich, on Friday, February 1st, 1935, with the President, Mr. P. J. Welch, in the Chair.

The following members signed the attendance register: Messrs. J. D. Broome, J. L. Buckingham, F. L. Gooch, T. G. Heatley, S. E. Hill, W. F. Howes, D. S. Jack, W. F. Loveless, C. C. Nesling, N. F. Pollock, H. P. Standley, Sen., H. C. Swann, W. H. Wortley, and H. P. Standley, Jun., Hon. Secretary. Professor J. McCunn, Messrs. S. G. Poles and P. W. Southern were present as visitors.

At the outset of the proceedings a display of cinema films, mainly depicting operative technique in the smaller animals, was given by Professor J. McCunn, of the Royal Veterinary College, London, assisted by Mr. Southern, technical assistant at the College. Professor McCunn was the operating surgeon in several of the films shown and the comments he gave to the audience at various stages were very interesting and instructive.

Professor McCunn's Address

In the course of his remarks Professor McCunn said: The use of the cinematograph as an aid to a teacher has for some years been an established fact. One can at will, and at any time, demonstrate almost any known condition or lesion. When applied to such a subject as surgery it is invaluable. The capacity of your lecture room is the only bar to a clear view for any member of the class.

Details of preparation, procedure and technique can be intimately demonstrated. The pictures can be stopped at will at any given point and nowadays we can even reverse them in order to go over again any points not fully appreciated.

When Mr. Standley asked me to come down there was no time for the preparation of a paper and, to fill the gap, I have brought a selection from our cinema library. You will be able to judge at first hand whether you think that they are of value or not. I have with me a "mixed grill" and if time allows and you are not bored, Mr. Southern and I intend to give you a selection which includes the following operations: hernia, metrectomy, enterotomy, gland grafting in the dog, thrombosis and artificial insemination in the horse, and rumenotomy in the ox. We have also a film showing rabies in a boy—it is rather a terrible film and I will comment on its significance in due course.

* Received for publication, April 1st, 1935.

Remarks on Individual Films

Hernia: This illustrates a case of inguinal hernia in the bitch. You will notice the care taken completely to separate the peritoneal sac. The twisting of this sac and its subsequent ligature are clearly demonstrated. The effective ligaturing of the peritoneal sac has long been recognised by surgeons as the most essential feature of the operation. A great human surgeon once told me that he thought that no other suture was really necessary. I am inclined to agree with this view, for an insecurely tied sac is almost certain to lead to recurrence.

Metrectomy: The subject in this case was a chow bitch. You will notice that, after ligature of the ovarian stump, the broad ligament is ligatured in sections. I am of the opinion that this step is most important. One does not fear death from hæmorrhage, for the dog appears to be able to deal with considerable loss of blood into the abdomen. This remark also applies to the cat.

I am convinced that by ligaturing and so keeping the operation area dry, healing is accelerated and adhesions limited.

It is my practice to secure the stump in one strong ligature; probably the best material to use is a No. 1 thread (Coats). The uterine vessels are included. The stump is touched with acid carbolic, swabbed dry, and then covered by a piece of the broad ligament. A triangular-shaped portion of broad ligament is always saved for this purpose. The apex of the triangle is at the stump. This flap is twisted around the stump and secured by a single ligature of fine silk.

Enterotomy.—This operation was performed for the removal of a portion of a rubber ball. It calls for little comment, except to say that one should never despair of recovery. In this case the foreign body had been wedged in the gut for three weeks and an area of bowel, about one foot in length, was prune coloured and almost necrotic. It was with great difficulty that the sutures could be made to hold. The dog's condition was such that enterectomy was out of the question. The abdominal cavity was full of blood-stained fluid. Ten c.c. of *B. coli* serum was given and I am inclined to think that this serum saved the dog's life. Since this occasion I have frequently made use of *B. coli* serum with good results.

Gland Grafting: Rejuvenation operations are simple to perform. Untoward sequelæ are rare.

I have used two methods: (1) Steinach's ligature of the Vas deferens, and (2) the method of Voronoff, *i.e.*, transplantation of a portion of testicle. Ligature of the Vas is simplicity itself. The neck of the scrotum is stretched over the first finger of the left hand. The Vas deferens can be felt as a hard cord. Cut straight down on to it, pick it up with forceps, crush it and ligature. It is only necessary to do one side.

In the Voronoff method a donor is necessary and in the picture you see the extraction of his testicle by an assistant. In the recipient a pouch is prepared in the flank. The testicle and epididymis is cut in half, trimmed of tags and anchored in the prepared pouch.

[Numerous instances were quoted in which improvement of sexual functions, general condition and also of racing ability were striking features.] On the whole, the results of this operation in dogs are similar to those reported by Dr. Norman Haire in men.

In the operations shown so far Mr. C. Formston was my most efficient assistant.

Thrombosis: This picture was presented to the college by Mr. Cross, the principal of the Egyptian College. It is so well prepared that very little explanation is necessary. The animal is seen to be sound, then after exercise very lame, the lameness and distress being progressive. The clot is shown in a *post-mortem* preparation of the iliac vessels. The picture ends with an illustrated diagram indicating the site of obstruction and the arterial supply of the hind limb.

Artificial Insemination: You are all familiar with this operation, but probably not on the grand scale as practised in Russia. Professor Ivanoff is the operator. The picture is self-explanatory and you will notice that the zebra-marked sire transmitted his typical markings to his progeny.

This picture was taken some years ago. I believe that artificial insemination of stock is an integral part of the Russian five-year plan. It certainly explains the large shipments of male pedigree animals which have taken place during the last few years. One can visualise that operations such as this, conducted on such a grand scale, are bound to leave their mark on the animal population and might conceivably completely alter the type of indigenous stock.

Rumenotomy: This operation was performed by my colleague, Professor Wright, assisted by Mr. Formston. The stages of the operation from casting to closure of the flank are clearly shown. The foreign body removed was a piece of metal. The beast made a good recovery with complete cessation of the digestive symptoms.

Rabies: This is an authentic picture of rabies in a small boy and if it is too tragic, please stop me. I show it as an object lesson indicating the benefits which follow the adoption of well-considered veterinary police regulations such as our quarantine laws. Few of our colleagues have seen rabies in animals and after viewing the picture I am certain that you will never condone any diminution in the severity of our importation of dogs orders.

In conclusion, I wish to thank you on my own behalf and on behalf of Mr. Southern—to whom most of the credit is due, for he is our cinema technician—for the kind reception of a somewhat mixed programme.

At some future date I hope again to have the pleasure of visiting one of your meetings.

Discussion

Mr. H. C. Swann asked what fees were charged for the dog operations that had been depicted.

Professor McCunn replied that that depended on the district. In the East End, where he had practised, the most he received was a guinea. Nowadays, though he could not perform the operations any better, people paid him £5. He had heard recently of two such operations carried out by a surgeon at the homes of the dogs' owners and fees of 25 guineas and 50 guineas being paid.

Replying to Mr. J. L. Buckingham, the Professor said cows and birds were perhaps the best subjects for chloroform. He also preferred chloroform as the anæsthetic for dogs. Some people, however, had different ideas. Ether was used quite a lot, but it took longer to get a dog under with this compared with chloroform and morphia.

Mr. H. P. Standley, sen., said his experience with ether for dogs had also been that a long time elapsed before getting the desired effect.

Professor McCunn: " And you are more likely to have trouble with the lungs with ether." He added that he did not like to use nembutal.

Mr. H. P. Standley, jun., said he had done better with nembutal than with chloroform.

Professor McCunn: " A friend of mine swears by it, but I am a bit frightened of it because I have had losses when using it, whereas chloroform and morphia are almost 100 per cent. effective."

Mr. Standley, jun., having observed that they gave nembutal by the mouth, Professor McCunn commented that at the college it was administered intravenously. It was a question of starting sooner.

The President voiced his appreciation of the lecture.

In answer to a further question from Mr. Buckingham, Professor McCunn observed that silk was used in most of the operations. In abdominal work he really preferred cat-gut, but one had to bear in mind expense, for cat-gut which was absolutely reliable from the

point of view of sterility and durability, was much dearer than silk.

Captain Wortley having commented on Professor McCunn's statement that he favoured morphia and chloroform for the anæsthetisation of dogs, the Professor said: "I have used this method for a long time and attained some degree of efficiency and safety in its application. Avertin and nembutal are very good. I was never a great advocate of avertin, but nembutal impressed me very much. Recently, however, after a series of calamities which I attributed to the use of this agent, probably erroneously, I have reverted to my old method. I find the great disadvantage of these new anæsthetics is that one does not know of any reasonable antidote if occasion arises.

"Like Captain Wortley," continued Dr. McCunn, "I have seen rabies in the East and can confirm his impression that 'whisky' seems to be greatly favoured as an antidote by the European population." Replying to Mr. Gooch, he had never seen a case of true iliac thrombosis that had recovered. Mr. Gooch's case was remarkable in that the animal possessed a double external iliac artery.

Mr. J. L. Buckingham proposed a hearty vote of thanks to the Professor, saying it was a great advantage to have as lecturer the man who, on the films, was doing the actual operations.

Mr. Standley, sen., seconding, said the members had had a great treat and were much indebted to Professor McCunn, especially as he came at very short notice to get them out of a difficulty. They had all learned a good deal from him and were very grateful to him.

Mr. F. L. Gooch supported the proposal, which was cordially adopted.

The Business Meeting

The business meeting was then proceeded with.

Correspondence.—From Messrs. H. Buckingham, J. Buckingham, sen., M. Bray, H. Downe, W. F. Loveless, G. Matthews, E. Brayley Reynolds, W. Shipley, J. F. Thurston, W. Turtill, P. R. Turner and W. Waters, regretting their inability to attend the meeting.

2. From Mr. J. Cochrane Dyet and Major F. Hogg (who is now in China) resigning their membership of the Association. It was decided that these resignations be accepted with regret.

3. From Mr. C. C. Nesling, suggesting that the annual subscription to the Association be increased to one guinea. Mr. Nesling spoke in support of his suggestion, saying that he thought the Association should have more funds in hand in order to be in a position to subscribe to objects they thought worthy of support. It would not be hard for a member to subscribe a guinea instead of half that amount.

Mr. H. P. Standley, jun.: "The Secretary has enough trouble to get in the half-guineas; I do not know what would happen if the subscription were doubled." (Laughter.)

Mr. Standley, sen., commented that they used to get a guinea in pre-war days, when he was Secretary. He should like the subscription increased to a guinea; they would then have more to distribute to charitable institutions.

Mr. N. F. Pollock expressed the view that the subscription should be governed by what was considered necessary to carry on the work of the Association. He did not believe in the Association accumulating money in the bank, it only encouraged extravagance.

Mr. Nesling said he only threw out the idea as a suggestion; he was prepared to give notice to move the alteration of the rule governing the subscription, in order that it might increased to one guinea, the matter to be on the agenda for discussion at the next meeting.

Mr. Standley, sen., seconded and this was carried.

4. From the Royal Sanitary Institute, inviting the Association to send a delegate to their Congress to be held at Bournemouth from July 15th to 20th. It was decided that the newly-elected President, Major W. Wortley, be asked to attend.

5. From the N.V.M.A., concerning the proposal that a composite subscription should be instituted to cover membership of the N.V.M.A. and its divisions.

Mr. Standley, sen., pointed out that many who were members of district associations did not belong to the N.V.M.A., and the latter felt that there should be discussion of the suggestion that there should be one subscription covering membership of both, so that all should come into it. He was in favour of one fee, covering the whole under one organisation, but he was dissatisfied with the probability that the individuality of the branch associations would be taken away on the financial side. They would have to have a grant from the N.V.M.A. to work the scheme. It was a big question and he did not think it was one they could settle without a good deal of discussion and thought. The N.V.M.A. were of opinion that people should not be members of the branch association unless they belonged to the "National" as well.

After further discussion, Mr. Standley, sen., proposed and Mr. C. C. Nesling seconded a resolution in opposition to the N.V.M.A. scheme. This was carried unanimously.

A letter was also read from the N.V.M.A. regarding the organisation of free treatment of the animals of owners too poor to pay professional fees. It was pointed out that local arrangements were satisfactory in this direction.

New Members.—Captain W. F. Medlock and

Mr. S. G. Poles were elected to membership of the Association.

Accounts.—The balance sheet of the Association for the past year was then presented and was accepted. It was decided to send an additional donation of £5 to the Victoria Benevolent Fund; also that the usual subscription to the Royal Agricultural Benevolent Institution be forwarded.

ELECTION OF OFFICE-BEARERS

President.—The retiring President proposed as his successor Major W. Wortley, who, he said, was well fitted in every way to do justice to the position. Mr. Welch thanked all connected with the Association for the loyal support that had been given him during his year of office as President.

Mr. POLLOCK seconded the election of Major Wortley and this was carried with applause.

Major WORTLEY then took the Chair and expressed his appreciation of the confidence the members had shown in him, adding that he would do his best to justify that confidence. His first duty gave him great pleasure, and that was to move a vote of thanks to Mr. Welch for the able manner in which he had filled the Presidential Chair. This was carried with applause.

Vice-Presidents.—Mr. G. T. Matthews, Captain W. Waters and Mr. P. J. Welch.

Committee.—Messrs. V. Boyle, P. R. Turner, W. Shipley, W. H. Dennett, W. J. Browning, H. P. Standley, sen., E. B. Reynolds, T. G. Heatley and W. A. Wood.

Auditors.—Messrs. H. Buckingham and T. E. Barcham.

Hon. Secretary.—Mr. H. P. Standley, jun.

Representatives on the N.V.M.A. Council.—Messrs. G. T. Matthews and H. P. Standley, sen.

The Secretary then read, on behalf of their representatives, a summary of the work done by the N.V.M.A. Council during the past twelve months.

Next Meeting.—It was decided that the July meeting should be held at Great Yarmouth.

Obituary.—The President made sympathetic reference to the loss sustained by a member of their Association, Mr. P. R. Turner, of Bury St. Edmunds, and it was agreed that a letter of condolence should be sent to Mr. and Mrs. Turner.

The meeting closed with a hearty vote of thanks, for his conduct in the Chair, to the President, who afterwards entertained the members to tea.

H. P. STANDLEY, JUN., *Hon. Secretary.*

Mr. F. W. Buttle has been nominated as president-elect (1935-1936) of the Hackney Horse Society to succeed Mr. Joseph W. G. Smith. The annual general meeting of members will be held at Weymouth on June 7th.

CENTRAL VETERINARY SOCIETY

Upon the last occasion that Mr. H. D. Jones favoured the Society with a paper, the essayist, conscientiously concentrating his attention upon its pages, looked up to find the room empty, thanks to the rival interest supplied by enemy air raiders. Happily, the Fellows attending the meeting of the Society held on April 4th, 1935, were permitted to follow him undisturbed in his interesting presentation of the still important subject, "The economic feeding of the commercial horse," at the Conway Hall, W.C.1.

The President, Mr. L. S. Balls, occupied the Chair, and there were also present Mr. J. H. L. Addis, Mr. W. Brown, Capt. R. E. C. Bullen, Dr. Fred Bullock, Mr. H. E. Bywater (Hon. Secretary), Major C. Davenport, Major W. Denington, Miss C. M. Ford, Lt.-Col. H. Greenfield, Miss K. Hernaman-Johnson, Sir Frederick Hobday, Mr. J. W. H. Holmes, Mr. J. D. Jones, Mr. H. C. P. King, Mr. Herbert King, Major Hamilton Kirk, Capt. J. F. Macdonald, Mr. M. O. J. McCarthy, Dr. J. McCunn, Mr. J. W. McIntosh, Professor W. C. Miller, Major-General Sir John Moore, Colonel W. S. Mulvey, Mr. W. Perryman, Mr. C. R. A. Powell, Vety.-Col. G. Rees-Mogg, Miss K. W. Shedlock, Capt. R. J. Stow, Mr. C. N. Thompson, Capt. W. K. Townson, Mr. F. W. Willett, Mr. J. Willett, Professor G. H. Wooldridge, Dr. W. R. Wooldridge and Capt. E. H. Wyly. Mr. K. Bolton, and Señor and Señora R. Yoviano (Brazil) were present as visitors.

The Minutes of the February and March meetings of the Society, having received publication in *The Veterinary Record*, were taken as read and were confirmed and signed.

The only item of correspondence was a letter expressing his regret for inability to attend the meeting, from Lt.-Col. E. P. Argyle.

Fellowship Nomination and Elections.—Mr. T. J. Maguire, 90, Romford Road, E.15, was nominated for Fellowship by the Hon. Secretary, seconded by the Hon. Treasurer (Dr. McCunn), and the following were unanimously elected as Fellows of the Society: Mr. J. Fox, Little Shalford, Dagden Road, Shalford, Guildford (Proposer, the Hon. Secretary; Seconder, the President); Professor W. C. Miller, Royal Veterinary College (Proposer, Professor Wooldridge; Seconder, the Hon. Treasurer) and Miss O. Uvarov, "Whyteleafe," Bridge Street, Leatherhead, Surrey (Proposer, Mr. N. S. King; Seconder, Professor Wooldridge).

MORBID SPECIMENS AND CASES OF INTEREST

Mr. H. D. JONES exhibited a pedal bone and portion of a median nerve, taken from a horse which, said the exhibitor, was unnerved four or five years ago and went perfectly sound until

recently, when it was destroyed, being slightly lame.

He cut a portion of the nerve out. He thought anastomosis had taken place, but the interesting feature of the case was the lesion in the pedal bone. He thought it spoke well for median neurectomy that, despite the exostosis shown in that pedal bone it had rendered the horse practically sound.

Miss C. M. Ford said that she had no actual specimen to show, but that afternoon she had rather an alarming experience in putting an animal down. This was a queen cat, heavily pregnant, and quite young. She gave it three gr. nembutal intrathoracically and followed this, in five minutes' time, when the cat was completely anæsthetised, with 10 c.c. chloroform into the left ventricle. To all appearances, death ensued, there being no corneal reflex and the rectum being completely relaxed—an occurrence which she had always regarded as an infallible indication of death. About two minutes later, however—fortunately, the owner had gone—the cat began to kick violently, though there was still no corneal reflex, and she waited to see what would happen. The violent spasmodic action of the limbs continued for half an hour; then she put 5 c.c. HCN into the chest. Five minutes later the fore legs stopped and a quarter of an hour later the hind legs: a period of three-quarters of an hour subsequent to the injection of chloroform.

She was hopeful that some Fellow of the Society with greater experience than she possessed, could explain that alarming occurrence.

In reply to Capt. Macdonald, Miss Ford said that there was no rotatory movement that she could see. The heart she could not feel at all, and as she suspected that the cat had ringworm she did not want to contaminate her stethoscope.

Professor G. H. Wooldridge, appealed to by the President for his opinion, said that he thought that this was one of those strange cases of idiosyncrasy. It was not possible to attribute any direct cause to that unusual train of circumstances. The administration of 3 c.c. of nembutal would appear to be sufficient to destroy the cat, as also, of course, would the intracardiac injection of 10 c.c. chloroform: in conjunction, they would appear to leave no loophole for such an unfortunate occurrence as Miss Ford had experienced.

Mr. W. Perryman said that he would like to make a few remarks on Mr. Jones' specimen, which he thought to be in some respects unique.

Here was a case in which neurectomy had been performed, four or five years ago, and in which the animal, when destroyed, was only very slightly lame. He had always had a doubt whether a nerve, subsequent to neurectomy, ever anastomosed with its cut section: this looked as though it had done so, but the "connecting link" might be fibrous tissue, and he thought they should await the result of histological examination before coming to a definite opinion on the point.

He thought it was interesting that the pedal bone came from the same animal because so often it had been said at their meetings that side bones never caused lameness without ring-bone. He did not suppose that Mr. Jones would have unnerved that horse unless it had been lame from side-bones; it was good evidence that side-bones did cause lameness without any accompanying ostitis or articular trouble.

He should like to know whether there really was nerve structure contiguous with the lower end, *i.e.* attached to the pedal bone: it would, perhaps, solve the problem in his mind as to the reunion of the nerve.

Professor Wooldridge said that he had not intended to speak on that point, but he felt that some of the statements made by Mr. Perryman regarding sidebones and lameness were due to a misunderstanding of views which had been expressed at one time or another at that Society. Mr. Perryman's point was, that sidebones could and did sometimes cause lameness without ringbones. So far as Professor Wooldridge knew, that statement had never been controverted, but it had been said that uncomplicated sidebones never caused lameness. It was quite obvious that a sidebone pressing on nervous structures would cause lameness even in the absence of ringbones.

In regard to the union of nerves, he thought it must be taken that the ends of the nerves did not directly reunite after neurectomy. The distal portion of the axis cylinder degenerated, but the proximal end usually extended, and in this way it might pass into the nerve sheath and so eventually reach the end, and re-innervate the part. In this way renewed sensation in previously unnerved parts might become restored. This was the reason for advocating the removal of a considerable portion of a nerve at neurectomy, in order to prevent the current being re-established.

Mr. Perryman stated that he quite appreciated what Professor Wooldridge had said about side-bones not causing lameness in the absence of other complications. At the same time the Professor had made the statement that the pressure of the side-bone would cause pain in the sensitive structures beneath, yet he had heard it said several times that side-bone never caused lameness without ring-bone complication.

Capt. Macdonald said that he would like to suggest that there was a certain amount of disease in the pedal bone itself which might account for the lameness apart from the side-bone.

Professor Wooldridge received a negative answer from Mr. Jones to his enquiry as to whether there was any suggestion of an amputa-

tional fibroma at the end of the cut nerve that might have been responsible for recurring lameness.

In reply to the PRESIDENT, who asked him if he would pass as sound a horse with side-bones, the horse having very small feet, Professor WOOLDRIDGE said that he would never, under any circumstances, pass as sound a horse with side-bones, though he might recommend its purchase under certain conditions.

Paper.—The President now called upon Mr. Jones to present his paper, which was heard with much appreciation and promoted a well-sustained discussion. In calling upon Mr. McIntosh to open, the PRESIDENT described the paper as a very practical one, and one well calculated to induce other Fellows to record their views on the economic aspect of feeding the commercial horse. [The paper and a report of the discussion are reproduced at the commencement of this issue—*Editor.*]

The customary heartily-accorded votes of thanks concluded the proceedings, but, prior to their close, the meeting heard with interest an account of his recent visit to Australia given by Mr. F. W. WILLETT. In the course of his observations, Mr. Willett said that he visited Melbourne and met Professor Woodruff and, at Sydney University, Professor Stewart, both of whom wished him to convey their best wishes to the Fellows of the Central Veterinary Society. (Applause.) He had a wonderful time with them, and a most enjoyable experience altogether. For part of the time it was "a 'bus-man's holiday," for he went with an Australian for a three-days' trip into mountainous country, where they visited many farms and were well received, and while there he assisted in speying 23 cows in four hours. The animals stood in the byres, the head through the yolk and a leg tethered to a post. Seventeen out of the 23 were operated on *per vaginam* and the remainder —heifers—were operated on through the flank. Subsequently he learned that there was only one fatality, and that from a cause quite unconnected with the operation. No anæsthetic was used—an omission which, quite rightly, would not be permitted here.

H. E. BYWATER, *Hon. Secretary.*

FOOT-AND-MOUTH DISEASE IN DORSET

Two fresh outbreaks of foot-and-mouth disease in Dorset were confirmed on Saturday last. One was on a farm at Iwerne Courtney, where the original outbreak led to the destruction of over 2,000 head of cattle at Sturminster Newton. Here 251 sheep, 51 cattle, and 30 pigs have been destroyed. The other outbreak was on a farm at Puddletrenthide, where 366 Dorset horn sheep, 44 cattle, and 35 pigs were slaughtered. An application heard by the Dorset Diseases of Animals Committee at Dorchester on Saturday to reopen the Wareham, Gillingham, and Wimborne markets was refused owing to the fresh outbreaks.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

May 8th.—Meeting of the West of Scotland Division, N.V.M.A., at Glasgow.

May 9th.—Last day for nominations for election to R.C.V.S. Council.

May 10th.—Extraordinary General Meeting of the Royal Counties' Division, N.V.M.A., at Caversham Bridge Hotel, Reading, 6 p.m.

May 13th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4 p.m.

May 17th.—Meeting of the Mid-West Division, N.V.M.A., at Bristol University, 2.30 p.m.

May 23rd.—Meeting of the Lancashire Division, N.V.M.A., at Manchester.

May 23rd.—Voting Papers issued R.C.V.S. Council Election.

May 30th.—Last day for return of Voting Papers R.C.V.S. Election.

June 6th.—R.C.V.S. Annual General Meeting, 12 noon; Luncheon, 1.15 p.m. Annual General Meeting, Victoria Veterinary Benevolent Fund, 12.45 p.m.

June 13th.—D.V.S.M. Examination begins, Edinburgh.

June 14th.—Fees due for July Examinations, R.C.V.S.

June 26th.—R.C.V.S. Committee Meetings.

June 27th.—R.C.V.S. Committee Meetings.

June 28th.—R.C.V.S. Committee and Council Meetings.

June 30th.—Final date for payment of Annual Fees to R.C.V.S.

July 1st.—R.C.V.S. Diploma Examinations begin.

July 29th—August 2nd: N.V.M.A. Congress at Belfast.

August 24th.—Last date for entries for Jubilee Memorial Prize Examination.

Sept. 24th to 25th.—Jubilee Memorial Prize Examination.

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R.C.V.S. ANNUAL LUNCHEON

Invitations to attend the Royal College Luncheon fixed for Thursday, June 6th, will be issued to all members with the annual voting papers, but the Secretary would be glad to attend to applications for tickets from now onwards. A remittance for 6s. 6d. in respect of each ticket required should be sent with the application to 10, Red Lion Square, London, W.C.1.

The holding of a Luncheon is an innovation, but we have every reason to believe that it will be a success.

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R.C.V.S. OBITUARY

Hunting, Charles Samuel, sen., Haswell, Sunderland, Durham. Graduated London, January 3rd, 1881. Died April 22nd, 1935; aged 80 years.

Powell, Benjamin Augustus White, Major late A.V.D., Lynton, St. Leonards Road, Eastbourne. Graduated December 18th, 1871. Died April 26th, 1935; aged 82 years.

Reeks, Harry Caulton, jun., Red Lion Street, Spalding, Lincs. Graduated London, July 23rd, 1923. Died April 27th, 1935, aged 33 years.

Mr. C. S. Hunting, M.R.C.V.S.

The late Mr. Charles Hunting, whose death we record above, was a cousin of William Hunting, the revered founder of this journal. He practised in County Durham for nearly 50 years.

Mr. Hunting leaves two sons, one being Mr. C. S. Hunting, F.R.C.V.S., of Loughborough, and five daughters.

Mr. H. C. Reeks, jun., M.R.C.V.S.

The death of Mr. Harry Reeks, jun., who was found lying near his garage with a fatal gun-shot wound, will come as a profound shock to the great number of those in the profession who enjoyed the personal friendship of the popular young Member, of so pleasing a personality, now taken from us, and the deepest sympathy will be extended to his sorrowing parents. Mr. H. C. Reeks, sen., is, of course, one of the best-known members of the practitioner community, and an ex-Examiner, R.C.V.S. It is surmised that an accident occurred. At the inquest on Monday night, the theory was put forward that deceased caught his elbow on the garage door causing a shot from a pistol, which he usually carried in his car, to hit him. The coroner (Mr. C. M. Bowser) who sat with a jury, returned an open verdict. It was stated that deceased had acted normally in every way before the tragedy.

He took the deepest interest in his profession, his work being his hobby also, and was regarded as one of the most able among the younger surgeons in the veterinary world. At the time of his death he was assisting his father.

Mr. Harry Caulton Reeks, jun., received his early education at Spalding and Moulton Grammar Schools, before going to the London College. The fact that three generations—father, (the deceased's grandfather, Mr. F. H. Reeks), son, and grandson—graduated at the same college in London is believed to be a record.

He proved himself to be a very capable practitioner, and had a distinct flair for diagnosis. As Hon. Secretary of the Lincolnshire and District Division, N.V.M.A., he did splendid work, and it was through his hard efforts that the Society has become a live force—it will indeed be difficult to fill his place.

Mr. Reeks was a keen sportsman, and he took a delight in shooting and in training dogs. He had a shoot at Witham-on-the-Hill, near Bourne.

He was a member of the Hundred of Elloe Lodge of Freemasons, of the Spalding Club, Spalding Gentlemen's Society, and of the Constitutional Club.

The name of Reeks first became known in Spalding in 1867, when the late Mr. F. H. Reeks came to the town as an assistant in his profession to the late Mr. R. Metherell, who carried on business in Red Lion Street. He stayed for about two years, and then returned after ten years' absence in Dorsetshire to set up business at Linden House, High Street, then Westlode Street, before removing to Red Lion Street, where the practice is still carried on by his son, Mr. H. C. Reeks, sen.

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PERSONAL

Appointments.—Mr. Donald Johnston, M.R.C.V.S., D.V.S.M., Veterinary Officer to the East Sussex County Council, has been appointed County Veterinary Officer for Bedfordshire.

The following Members of the Royal College of Veterinary Surgeons have been appointed to the New Zealand Government Veterinary Services, and sailed last week for that country: Messrs. A. R. E. Alexander, W. Gray, H. Doyle, W. D. Ross, J. T. Mullins. Another officer, Mr. McKenzie, will sail later.

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Birth.—Stewart: On April 24th, at Ivanhoe, Crewe Road, Nantwich, Cheshire, to Joan (née Dowlen) wife of Charles A. Stewart—a daughter (Margaret Ann).

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ZOOLOGICAL SOCIETY OF LONDON

Retirement of Sir Peter Chalmers Mitchell

At the annual meeting of the Zoological Society of London, held on Monday last, warm tributes were paid by the President (the Duke of Bedford) and others to the great services which Sir Peter Chalmers Mitchell has rendered to the society, to the science of zoology and to the countless visitors to the Zoo in Regent's Park and its Whipsnade Branch during his period of office as Secretary to the Society, which he now relinquishes after a tenure of 32 years.

As a memorial of these services a portrait of the retiring secretary, painted by Mr. William Nicholson, was presented to the society as a joint gift from more than 1,250 members. In the background of the painting is a map of the Whipsnade estate. Sir Peter Chalmers Mitchell and his staff have initiated continuous improvements in the health and hygiene of the animals, and the society can claim to have been a pioneer in the improvement of the conditions under which animals may be kept in captivity. On the scientific side the society's high reputation has been enhanced during Sir Peter Chalmers Mitchell's secretaryship.

The new secretary of the society is Mr. Julian S. Huxley. For some weeks Mr. Huxley has been familiarising himself with the duties of the post, and when his appointment was formally announced during the meeting he took the seat then vacated by his predecessor.

The annual report shows a definite recovery from the depression of the past two or three years. The assets of the society, now amounting to over £217,000, have increased by over £13,000 compared with 1933. There was a total increase of income of over £8,000, of which over £6,000 came from increased receipts from Whipsnade Park.

The health of the collection has been well maintained, and there has been an unusual amount of breeding. Among the more interesting mammals bred and reared during the year in the London Zoo were pig-tailed monkeys, lemurs, zebras, a tapir, a camel, a llama, a pygmy hippopotamus, a sea-lion, bison, yak, Cape buffaloes, waterbuck, nylghaie, eland, reedbuck, reindeer, wallabies, and tree-kangaroos. At

Whipsnade two zebras, three tigers, qne yak, one anoa, five nylghaie, and a very large number of red deer, fallow deer, water deer, muntjac, and wallabies were bred and reared. In London macaws, lorikeets, lovebirds, parrakeets, plovers, herons, and ibis, and at Whipsnade emus, rheas, sarus cranes, brush-turkeys, and many wild turkeys were among the birds bred and reared.

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ACCREDITED MILK SCHEME

Upwards of 1,500 producers have qualified under the Accredited Milk Scheme, which came into operation on May 1st, while reports from the counties indicate that thousands more have applied to their local authorities for Grade "A" licences.

Since the Scheme was first announced, county councils and municipal corporations have been considering the appointment of full-time veterinary staffs, as each Grade "A" herd has to undergo a clinical inspection every quarter. In the past, the main practice has been for the producer to bear the cost of these examinations, but, so far, (stated *The Farmers' Weekly* on April 25th), 16 counties have decided to remit all charges for herd inspection after licences have been issued to producers. These counties are: Cambridge, Cheshire, Derbyshire, Devonshire, Durham, Essex, Hertfordshire, Kent, Leicestershire, Middlesex, Northumberland, Rutland, Surrey, Sussex (East), Sussex (West), the West Riding of Yorkshire.

Other county councils are reviewing their position, and it is expected that this list will be considerably extended before long.

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Addressing a meeting of the Farmers' Club, held at the Royal United Service Institution, Whitehall, on Monday, Mr. Sidney Foster, general manager of the Milk Marketing Board, said the board believed that the accredited milk scheme which was about to come into operation would, if generally adopted and wisely administered, go a long way towards reducing to a very small proportion the occurrence of tuberculous organisms in milk.

Mr. Foster said at the outset that in a few days' time milk producers, through their board, would have embarked on the Accredited Milk Scheme; they would be financing a plan to improve the standard of production throughout the country. It might be asked whether the scheme was necessary. Was there a case made out for a campaign to improve the hygienic quality of milk? The facts, unfortunately, suggested that there was. Many producers were to-day reaching a highly satisfactory standard, but their results were prejudiced by the shortcomings of other producers whose supplies were below standard. A national authority responsible for marketing the milk of the country could not acquiesce in unsatisfactory methods of production and at the same time expect to improve the market for the producer. It was not possible to introduce a scheme for a roll of accredited producers at the outset of the Milk Marketing Board's operations, but as soon as the new organisation had established itself, then the board began to investigate the conditions that should be prescribed as an "accredited" standard of production. Eventually the conclusion was reached that the standard of production for admission to the accredited producers' register must be healthy cows, efficient methods, and satisfactory milk of Grade A standard.

The standard to be reached in Grade A milk production was within the range of the competent producer. The bonus scheme which was to come into operation related only to milk of Grade A quality. The board were now responsible for the welfare and conduct of the milk industry in so far as it related to producers, and their organisation must line up with the demand that had grown more and more pressing in recent years for a positive effort to improve the purity of milk when it left the farm. Their aim was to produce better milk and to give the public greater confidence in their product. The board believed that the inducement of the penny a gallon now offered would result in a national effort being made to effect a substantial improvement in quality production. To provide a better price to the producer who provided the better milk was the keynote of the scheme. If the board's scheme succeeded in raising the standard of production of several thousand farms to Grade A it would have accomplished a great deal. Their progress might not end with Grade A production, for it was acknowledged that a higher plane of production was ultimately desirable, but that must be reached by stages.

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ANTI-HÆMORRHAGIC VITAMIN "K"

Contributing to the current issue of *Nature* under the headings "The Anti-Hæmorrhagic Vitamin of the Chick: Occurrence and Chemical Nature," Mr. H. Dam and Mr. F. Schönheyder, of the Biochemical Institute, Copenhagen University, refer to their earlier description of a new deficiency disease in chicks which is characterised by a tendency to large hæmorrhages, certain pathological changes in the gizzard and anæmia, and is ascribed to the lack of a specific anti-hæmorrhagic factor which is different from vitamin C. The authors continue:—

"More recent work has demonstrated that the factor in question is a fat-soluble vitamin occurring in hog liver fat, in hemp seed and certain vegetables, such as tomatoes and kale, and—to a less degree—in many cereals . . . . The anti-hæmorrhagic vitamin cannot be identical with A and D, since very large doses of these vitamins in the form of concentrates or fish liver oils are ineffective in preventing the disease . . . 3 to 4 per cent. of hog liver fat will completely suppress the symptoms."

It is presumed that the food-stuffs mentioned contain an essential vitamin, in the absence of which a deficiency disease sets in, and since it cannot be identified with any known vitamin, it is to be called K.

The quantitative determination of the new vitamin is based upon the curative method. One unit of vitamin K is the smallest amount which during a certain time can bring a sick animal with a certain degree of morbidity to the normal state with respect to the clotting time. It is supposed that lack of vitamin K causes a decrease of the clotting accelerating component in the blood. The nature of this component as well as its possible rôle in animal and human pathology is now under investigation.

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AN UNUSUAL "UNSOUND MEAT" CASE

When a bull was about to be moved from one farm to another in Essex, it charged into a post and killed itself. The carcase was afterwards sent to London for sale, and, as a result of this, William Bonner French, of Bateman's Farm, Little Totham, was summoned at Clerkenwell Police Court, upon the information of Thomas Penman, Finsbury Borough Council Sanitary Inspector, for depositing for the purpose of sale in Charterhouse Street, E.C., on February

11th, four quarters of bull beef and a head, tongue, liver, and tail which were unfit for the food of man.

The prosecuting solicitor stated that, at the time of the mishap, the defendant was told that when an animal died in this way great care should be taken if it were to be utilised for food. It should be bled at once, and although in this case the animal's throat was cut, there might have been some delay, or, at any rate, the bull did not bleed freely, because there was evidence that the blood had practically saturated through the carcase. A more important point was that the animal should be opened at once, otherwise the whole system was liable to be poisoned.

A plea of "guilty" was tendered and the Magistrate on being informed that the costs of the prosecution were ten guineas, said he would have felt it his duty to impose a penalty but for the fact that the costs were so heavy. Having regard to the facts that the defendant had also suffered a considerable loss already and that he had not been previously convicted, the summons would be dismissed under the Probation of Offenders Act on payment of the costs.

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ROYAL SANITARY INSTITUTE CONGRESS

The programmes of the Sections and Conferences of the Health Congress, which is to be held by the Royal Sanitary Institute at Bournemouth from July 15th to 20th, are now complete. In addition to an address by the president of each section and conference, there will be a large number of discussions on varied subjects, including immunology; recent additions to the legislation dealing with the public health aspect of the milk supply; milk problems, with particular reference to bacteriological and biological standards; problems in the preparation and storage of meat; administration of the Food and Drugs (Adulteration) Act, 1928.

Following is the published information relative to the Section of Veterinary Hygiene:—

Section D., Veterinary Hygiene

President: R. G. Linton, ph.d., m.r.c.v.s., Professor of Hygiene and Dietetics, Royal (Dick) Veterinary College.

Recording Secretary: Lieut.-Colonel J. A. Dixon, t.d., m.r.c.v.s., Chief Veterinary Officer, Leeds.

Local Secretaries: Major J. Stewart Wood, m.r.c.v.s., Veterinary Surgeon and Inspector under Diseases of Animals Acts, Bournemouth Corporation; G. K. Fenn Smith, m.r.c.v.s., part-time Veterinary Surgeon, Bournemouth Corporation.

The Presidential Address will be delivered on the morning of Thursday, July 18th, to be followed by a discussion on "Problems in the Preparation and Storage of Meat." The Section will reassemble on the morning of the following day for the discussion on "Recent Additions to the Legislation dealing with the Public Health Aspect of the Milk Supply."

A very large attendance is expected at the Congress. Over 700 delegates have already been appointed by government departments, foreign and dominions governments and municipalities, and local authorities and learned societies, etc. in Great Britain. In addition, many members of the Institute will be attending privately, and with the officers of the Congress it is estimated that there will be an attendance of about 1,500.

A feature of the Congress is the Health Exhibition.

Particulars of the Health Congress and Exhibition can be obtained from the Secretary of The Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1.

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INTERNATIONAL BIOLOGICAL STANDARDS

The Health Organisation of the League of Nations announces the adoption of international biological standards and units for five further antisera. The total number of international biological standards is now 22; they comprise standards for nine antisera, old tuberculin, insulin, pituitary (posterior lobe) extract, the œstrus-producing hormone, three substances of the arsphenamine group, four vitamins, ouabain, and digitalis. The provision of biological standards for international use is entirely a post-war development, and is due to the work of the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations.

The activities of the commission are concerned mainly with standards for potent therapeutic agents, the activity of which cannot be adequately assayed or controlled by chemical means. "Many of these products have been introduced into medical practice in comparatively recent times," says *The Lancet*. "They are specific remedies, some of them potentially dangerous, most of them administered by injection, and their dosage must be precise. The main object of the commission is to secure international agreement as to the standards and units adopted, in order that the activity of all preparations of this class, in whatever country they may be produced, may be expressed in a common notation and based upon the same standard and unit. With the adoption of the same standards and units in all countries, laboratory and clinical investigations can be placed on a reasonably quantitative basis, the results of such investigations carried out in different laboratories and hospitals throughout the world can be correlated and compared, and minimum requirements as to quality, purity, and potency can be defined. The adoption, by international agreement, of common standards of reference facilitates the work of all—the research worker, the manufacturer, the administrator and the physician.

"In this country the international biological standards have been brought into effective use by means of the Therapeutic Substances Act and the British Pharmacopœia. Biological standards are maintained at Hampstead, and are supplied to licensees under the Act named, and to laboratories, institutions, and research workers in this country, and the overseas dominions. Ten of the standards have been wholly prepared at Hampstead where the preparation of several others has also been completed; a part of each of these standards has been retained to supply national and imperial demands. In other cases a part of the international standard, prepared in some other country, has been obtained for British requirements; and in still other cases national standards have been prepared at Hampstead and assayed exactly in terms of the corresponding international standard. In all cases, therefore, the biological standards provided for use in Greater Britain are either the actual international standards or their exact equivalent."

UNDULANT FEVER IN FRANCE

"Some years ago, Professor Nicolle described undulant fever as a disease of the future," says the Paris correspondent of *The Lancet* in the April 20th issue of that journal. "It was not recognised in France until 1909, but by the autumn of 1932, when the Mediterranean Hygiene Congress was held in Marseilles, an official circular put the annual total at the imposing figure of 3,000 cases. Next June the brucellar infections are to have a congress all to themselves—the Premier Congrès des Brucelloses—at Avignon.

"There seems to be no doubt that undulant fever is spreading, in more senses than one. Geographically, it has now extended from the Mediterranean littoral up the Rhone and to the Pyrenees and Alps. And not only are the numbers of human and animal cases growing in the infected areas, but cattle as well as goats and sheep are becoming reservoirs of the disease. In 1930 a research centre was established at Montpellier on the initiative of the Bertrand Bouisson Institute and the Rockefeller Foundation, and according to a report on its activities by Dr. R. M. Taylor, Dr. M. Lisbonne, and Dr. L. F. Vidal, in the February number of the *Mouvement Sanitaire*, it should be possible to reduce the number of human cases in which infection is due to the consumption of milk and its products and not to contact with infected animals. The boiling or pasteurisation of milk, before it is consumed as such or converted into cheese, is most certainly desirable and should not prove difficult, but the problem of protecting human beings in contact with infected animals is much less easy to solve. In theory, careful washing and disinfection of the hands after every dangerous contact should prove effective, but at the present time the unsanitary conditions under which human beings and animals live together in the south of France are very discouraging to the public health reformer. As for the action of vaccines hitherto prepared, the experience of the Montpellier centre with regard to both human beings and animals is not particularly promising, the immunity acquired by vaccination having so far proved comparatively feeble. It is, however, recommended that the vaccination of human beings be continued among rural populations which are less exposed to massive infections than are the laboratory workers whose reaction to such vaccination has been studied at Montpellier. The ideal solution would, of course, be vaccination of animals which protected them against not only abortion, but also infection. No reliable vaccine for this purpose has yet been prepared; the employment of such living vaccines for cattle is not without its dangers, and the authors have observed two cases of undulant fever due to *Br. abortus*, the source of which can almost certainly be traced to the handling of a vaccine destined for cattle. The alternative of a sanitary cordon around the areas already infected should be feasible. As far as the health of human beings is concerned, it is infection with *Br. melitensis* which must be combated by measures destined to keep the disease within its present geographical limits.

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Henceforth all dairy cattle exported to Britain from Canada must be shipped under special licence. There is to be more stringent inspection of such cattle, on account of the condemnation of numerous Canadian dairy cattle on landing by British inspectors and the resulting heavy losses to shippers.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue. All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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IS GRUNTING AN UNSOUNDNESS?

To the Editor of The Veterinary Record

Sir,—Mr. J. Willett has done well to ventilate this matter in his excellent letter in your issue of April 13th, and it is time the question was definitely settled whether grunting *per se* is an unsoundness. If not an immediate unsoundness, what is the likelihood of an animal so affected becoming unsound? Should an animal always be tested for grunting as part of all examinations for wind? Is a veterinary surgeon negligent if this is not done? These questions are very important from both a scientific and a legal aspect.

What is grunting? It might be defined as a violent expiratory effort through partially closed vocal cords, resulting in a grunting noise. I think one must recognise normal and abnormal grunts in the same way that one distinguishes between other respiratory sounds—some have no pathological significance, the vocal chords being normal; others, owing to a partial paralysis of the vocal chords, allow air to be expelled through the incompletely closed larynx and are accompanied by a particular noise which is indicative of this condition. Another grunt which is quite distinctive is made by a horse after the "roaring" operation.

If no other test could be applied I think one would be justified in stating that "the grunt was indicative of unsoundness," or "of an operation on the larynx." When other tests are available then, of course, they should be used, and if satisfied that there is no abnormality in the respiratory noises the horse should be passed. A great many horses and persons grunt when threatened with a stick or sudden movement but are perfectly sound in wind, and probably are not more liable to become unsound than is a more lethargic horse who does not fear the stick and so fails to grunt when feinted.

To condemn such horses without further trial is therefore unfair and incorrect. I think it can only be looked upon as *one* of the tests for wind, and although it may give valuable help at times it must not be considered as a conclusive test; also it must be left to the individual examiner to choose this or any other method of satisfying himself as to the soundness or otherwise of a horse's wind.

Yours faithfully,

Reading. Geo. P. Male.

April 24th, 1935.

[The above letter was received too late to permit of its publication in our issue of last week.—*Editor.*]

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"TUBERCULOSIS OF THE HIP-JOINT IN A CAIRN TERRIER"

To the Editor of The Veterinary Record

Sir,—With reference to an article on the above subject by Mr. J. F. D. Tutt, F.R.C.V.S., of Winchester, published in your issue of April 13th, there are one or two points that puzzle me.

(1) One wonders what grounds there were for diagnosing the hip as the seat of lameness in the absence of any evidence of pain in enforced movements of the joint.

(2) One would not have thought it possible

to palpate a callus which was so high on the inside of the limb as to involve the hip joint.

(3) Would not the application of a tuberculin test have been an aid to diagnosis?

(4) The prints of radiographs, as published in *The Veterinary Record*, are quite unreadable. I, for one, should be very interested to see the original films of such an interesting condition.

(5) One wonders what electrical treatment was expected to have any influence on this condition, whether it be traumatic or tuberculous.

I am,
Yours faithfully,
E. P. Barrett.

Eastdown House,
12, Clarendon Road,
Margate. *April 29th*, 1935.

. . . . .

To the Editor of The Veterinary Record

Sir,—Following the publication of my clinical note on the above in *The Veterinary Record* for April 13th, I received a communication from Mr. A. Noel Pillers, F.R.C.V.S., in which he suggested that the case might be one of Von Perthe or Legge's disease, and advised testing by the double intradermal method. In the interval which had elapsed between sending the article and its publication, this test was applied, and with negative results, and the dog is on the upgrade. I accordingly sent the skiagrams to Mr. Pillers who has examined them, and has also shown them to a distinguished radiologist, and both these gentlemen are of the opinion that it is certainly not tuberculosis but quite likely to be Von Perthe. Mr. Pillers adds that he had a case of Von Perthe in a Cairn, and that the animal had a typical history similar to the human disease.

Yours faithfully,
J. F. D. Tutt, F.R.C.V.S.

Winchester.

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STEEL TRAP

To the Editor of The Veterinary Record

Sir,—We wonder if all hunting men are aware of the cruelty and harm done by the gin trap? We are asking your readers to support the University of London Animal Welfare Society in its efforts to abolish the use of this barbarous instrument. The cruelty to any animal large enough to drag the trap is appalling, and unless found, they eventually die of starvation.

One West Country pack this season has killed nine foxes in traps, most of them after they had been in the trap for days. Another pack found three cats and two foxes dead in gins in one field, in a valley. These had died at different times, having all gone down the valley and being too weak to climb out. Not one trap had been set on this farm, so they must all have come some distance. At present trapping persists, because many farmers do not realise that the damage done by rabbits on a farm is much greater than the price paid for them by the trapper.

Funds are badly needed for the work and we should be very grateful for any contributions sent to the Secretary, University of London Animal Welfare Society, 68, Torrington Square, London, W.C.1.

Yours faithfully,
(Sgd.) A. H. Higginson (M.F.H., Cattistock.)
D. Horndon (M.F.H., Stevenstone.)
Dr. T. A. King (M.F.H., Tetcott.)
J. E. B. Lethbridge (M.F.H., Eggesford.)
W. C. Peel (M.F.H., East Cornwall.)
E. F. Talbot-Ponsonby (M.F.H., East Devon.)
G. P. Williams (M.F.H., Four Burrow.)
A. McDougall (Master, Fowey Harriers.)
R. C. Weatherby (Master, Cury Harriers.)

The Editor acknowledges, with thanks, the receipt of the following:—

Communications from Messrs. J. T. Turney and L. A. P. Brito (Worthing), Professor J. G. Wright (London).

Reports of meetings of the Dumfries and Galloway, and Lancashire Divisions, N.V.M.A., from Mr. G. A. Sangster and Mr. A. L. Mullen, respective Hon. Secretaries.

Diseases of Animals Acts

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 5th April, 1935	9	11	2	2,258	8	15	12	85	51
Corresponding period in									
1934	27	28	—	—	2	2	17	45	18
1933	10	10	—	—	10	19	4	68	36
1932	25	39	—	—	3	3	3	85	40
Total 1st January to 15th April, 1935	130	143	24	6,948	57	83	163	494	206
Corresponding period in									
1934	150	153	1	31	67	114	299	474	260
1933	117	137	54	5,161	78	147	179	314	125
1932	142	185	1	67	63	109	109	622	272

Note.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.

The humble Address of the Council of the Royal College of Veterinary Surgeons To His Most Excellent Majesty George V.

by the Grace of God of Great Britain, Ireland and the British Dominions beyond the Seas King, Defender of the Faith, Emperor of India.

May it please Your Majesty

1910 1935

We the Council of the Royal College of Veterinary Surgeons created by the Charter of Her late Majesty Queen Victoria granted in the Seventh Year of Her reign, desire humbly to present on behalf of Members of the Royal College of Veterinary Surgeons our loyal and cordial congratulations on the occasion of the 25th Anniversary of Your Majesty's Accession, and to declare our enduring loyalty to Your Majesty's person and Throne.

To the end that this country may long enjoy the blessings of Your reign, we pray that Your health may be preserved with that of Her Majesty Queen Mary for whom with all Your loyal subjects we entertain the most affectionate respect.

Given under the Common Seal of the Royal College of Veterinary Surgeons this fifth day of April One thousand nine hundred and thirty five.

G. H. Locke. President

Vice-Presidents

Secretary